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The Evaluation of Thermal Disciplines to Minimize Casualties for Operations in Southwest Asia

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THE EVALUATION OF THERMAL DISCIPLINES TO MINIMIZE CASUALTIES FOR OPERATIONS IN SOUTHWEST ASIA

1. INTRODUCTION

For many years, the U.S. Army has been concerned with how to conduct military operations in the various climates likely to be encountered throughout the world. Of greatest concern are the areas of the globe with extreme thermal environments, such as those found in Southwest Asia. The severe weather found in this area imposes a tremendous burden on the soldier, making it difficult, if not impossible, to accomplish the military missions required in combat. Heat stress becomes a real threat to a unit's ability to survive.

Current doctrine, as provided in U.S. Army Field Manual 21-10, outlines measures designed to minimize heat stress casualties, such as acclimatizing personnel to high temperatures as gradually as possible, encouraging soldiers to drink up to 4 gallons per day, and implementing work/rest cycles when the mission permits. Work/Rest ratios are determined as a function of the existing heat conditions. The practicality of implementing these work/rest cycles in the field is questionable as it is difficult to foresee stopping in the midst of a firefight to rest. The consequences of not stopping to rest, however, may be equally severe.

Extreme thermal conditions are magnified on the combined effects battlefield. While chemical protective gear (Mission-Oriented Protective Posture - MOPP) is designed to protect the soldier from the effects of chemical munitions, it is extremely hot to wear and adds significantly to the likelihood of heat stress. While soldiers may avoid becoming a chemical casualty, under certain conditions they may find it impossible to avoid becoming a heat stress casualty.

The current "Desert Shield" operation makes it imperative to evaluate the current work/rest doctrine. Critical questions that need to be addressed are: Does the current doctrine really minimize casualties to an acceptable level? Does the current doctrine allow for less than fully acclimatized and fully hydrated troops? Are work/rest cycles the best way to optimize the trade-off of casualties versus unit availability? Can a different work discipline be developed which would provide minimal casualties with a greater return on unit availability?

2. PURPOSE OF STUDY

The purpose of this study is to identify the advantages and risks associated with implementing different thermal work disciplines in a hot environment, such as that found in Southwest Asia.

3. STUDY APPROACH

In conducting this study, the Goldman-Givoni model was used to compare the different work disciplines considered. The Goldman-Givoni model, as implemented at Science Applications International Corporation (SAIC), predicts core temperature given specified set of meteorological conditions, work intensity, clothing worn, and level of acclimatization and dehydration. This core temperature is then used to estimate the resulting probability of casualty for a soldier in this environment. The probability of casualty, along with an estimate of availability for each work discipline, was then used to determine unit productivity.

4. THE GOLDMAN-GIVONI MODEL

The Goldman-Givoni model is based on equations generated by work conducted at the U.S. Army Research Institute of Environmental Medicine (USARIEM) during the late 1960s and early 1970s by Baruch Givoni and Ralph Goldman. Currently, there are at least three implementations of this model being used for different purposes in different organizations. The implementation used for this study was that originally coded by Dr. Klopcic at the U.S. Army Ballistic Research Laboratory for use in the combat simulation model known as AURA (Army Unit Resiliency Analysis) and subsequently modified by analysts at Science Applications International Corporation.[1,2]

The BRL implementation of the Goldman-Givoni model is written in Fortran 77. The foundation for the BRL implementation was the stand-alone FORTRAN model known as TCORE, described by Berlin, Stroschein, and Goldman, in 1975.[3] Initially, TCORE was used as a member of the AURA family of models to produce coefficients which were used as input values to the AURA model. TCORE has subsequently been modified and is now incorporated directly into the AURA model. This modified code has come to be called the BRL implementation of the Goldman-Givoni model. A verification of the model and a demonstration of its used was completed in April of this year.

The Goldman-Givoni model accepts inputs describing the meteorological conditions, working metabolic rate, clothing worn, initial skin temperature, level of acclimatization and level of dehydration being considered. The model then uses these inputs to determine the expected equilibrium core temperature of a soldier and the resulting probability of casualty. The BRL implementation of Goldman-Givoni also produces a distribution of the times at which the casualties are expected to occur.

One of the major differences between the assorted implementations of the Goldman-Givoni model was the relationship between predicted core temperature and the resulting probability of casualty. In the past, BRL had used a linear function where 38.5°C represented 0% probability of becoming a casualty and 40.5°C represented a 100% probability of becoming a casualty. The Military Ergonomics Division at USARIEM uses values provided by the IDF[4] in their Goldman-Givoni implementation. The Heat Research Division at USARIEM has adopted the use of the NIOSH-reported casualty data at different levels of core temperature.

Currently, both the BRL implementation of Goldman-Givoni and the SAIC implementation use a cumulative normal distribution to estimate probability of casualty given an individual's core temperature. The resulting curve is shown in Figure 1 and forms the basis for all the casualty predictions included in this report.

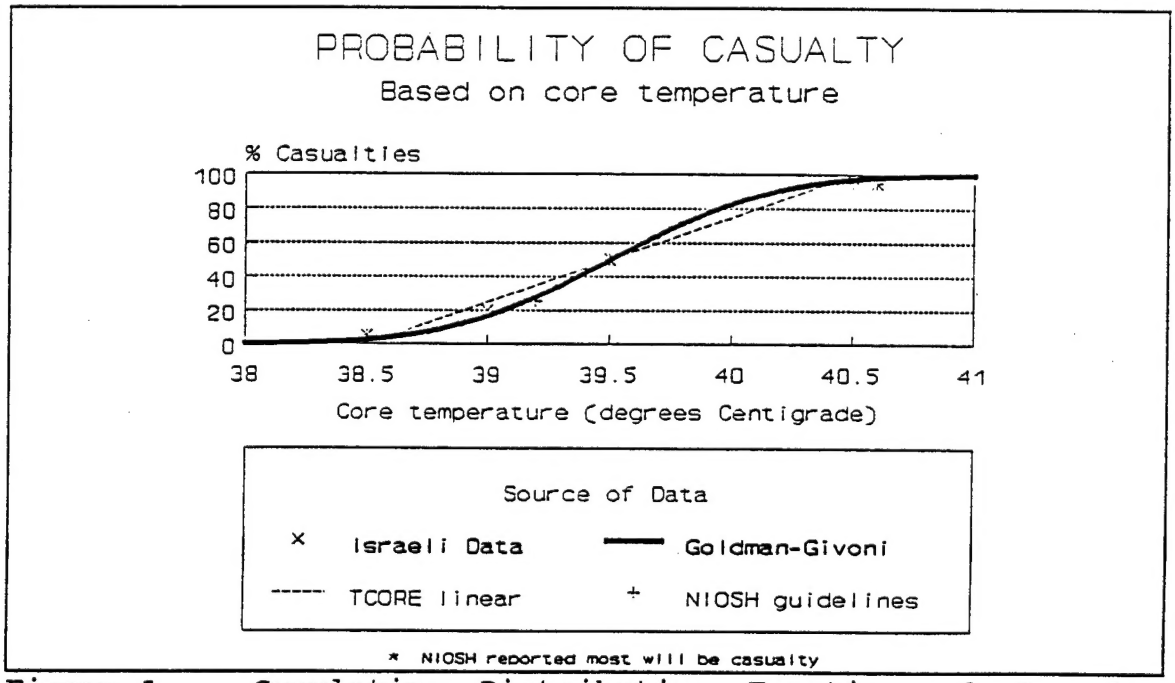

Figure 1. Cumulative Distribution Function of Casualty Probability Based on Core Temperature.

In order to examine the different work disciplines of interest, it was necessary to make some changes to the BRL implementation of Goldman-Givoni at SAIC. These modifications did not alter the calculations of equilibrium core temperature as used within the AURA model, but instead enhanced the model to provide a detailed tracking of core temperature over time. The methodology used to estimate core temperature at each time point is discussed in detail in Appendix A. Appendix B contains a listing of the Goldman-Givoni model as used at SAIC. Appendix C provides an example of typical inputs used for the model and some of the resulting outputs.

5. CONDITIONS IN SOUTHWEST ASIA

5.1 METEOROLOGICAL CONDITIONS IN SOUTHWEST ASIA

Meteorological Data collected in Dhahran, Saudi Arabia in July[5] was used for this analysis and is shown in Table 1. As can be expected, conditions change over the course of the day. As such, five time periods are outlined in the table for use in the study, with the most severe conditions prevailing between 1100 and 1500 hours.

Table 1. Average Meteorological Data for Dhahran, Saudi Arabia in July

LOCAL TIME	WINDSPEED M/S	WET BULB °C	DRY BULB °C	WBGT °C	SOLAR WATTS
0000-0700	2.9	21.5	31.1	24.6	0
0700-1100	4.6	21.5	35.6	27.3	516
1100-1500	6.4	22.6	40.9	29.6	519
1500-1900	6.1	23.0	39.1	28.7	361
1900-2300	3.3	23.1	34.5	26.6	0
2300-2400	2.9	21.5	31.1	24.6	0

5.2 LEVELS OF ACCLIMATIZATION AND DEHYDRATION

In severe weather conditions such as those found in Southwest Asia, it is vital that troops have a chance to acclimatize themselves to the conditions in which they will be expected to operate. Unacclimatized troops find desert operations extremely difficult and likely to produce a high number of heat stress casualties. Given the chance to work in these conditions for at least twelve days, soldiers will have a much better chance of avoiding heat stress than those new to the environment.

In this hot environment, it is also essential that troops maintain a strict regiment of water intake. It is well known that most humans do not drink enough fluids to maintain their bodies at full hydration but, instead, typically maintain a level of 2% dehydration while going about their normal routines. Severe dehydration (around 7%) will likely result in death.

For this study, four levels of acclimatization were examined: 0, 4, 8, and 12 days of acclimatization. In addition, four levels of dehydration were considered: 0, 2, 4 and 6% dehydration.

5.3 CLOTHING

The type of clothing worn by a soldier has a direct effect on his/her core temperature. Three different clothing combinations were evaluated for this study: the standard Battle Dress Uniform (BDU), the Battle Dress Overgarment (BDO) worn over underwear and the Battle Dress Overgarment worn over the standard Battle Dress Uniform (BDO + BDU). These last two clothing combinations represent the type of uniform worn to protect soldiers from chemical attacks. Table 2 lists the clothing parameters used in the analysis[6], along with their wind correction factors.

Table 2. Clothing Parameters Used in AURA Analysis

Type of Clothing	Clothing Parameters			
	Clo	Gamma	Im/Clo	Gamma
BDU	1.13	0.26	0.43	0.38
BDO	1.68	0.255	0.21	0.49
BDO + BDU	2.00	0.17	0.16	0.25

5.4 WORK DISCIPLINES

In the course of the study, several different work disciplines were examined and compared. These work disciplines included existing doctrine, modifications to this doctrine and a new work discipline. In all, eight work disciplines were evaluated.

In order to provide a baseline for comparison, the first "discipline" considered was no discipline, that is continuous work. Continuous work has the advantage of providing 100% availability but also results in a high level of casualties. Here, availability is used to indicate soldier is not restricted in the amount of time or in the intensity he/she is available to work.

Secondly, the work/rest discipline as outlined in FM 21-10 was evaluated. FM 21-10 specifies water intake and work/rest cycles for the heat conditions expected. As currently implemented, the commander is expected to predict the most severe conditions for the upcoming day and implement the corresponding work/rest cycle throughout the day. Table 3 has been extracted from FM 21-10 and shows the current doctrine for working in hot environments.

For the conditions studied (as shown in Table 1), the commander implementing this discipline in Southwest Asia would order troops to use a 45 minutes work/15 minutes rest cycle throughout the day. Theoretically, this work/rest cycle is sufficient to minimize casualties but provides, at most, 75% availability.

Table 3. Current Doctrine on Work/Rest Cycles as Listed in Field Manual 21-10.

Criteria		PMM[1]	
Heat Condition/ Category	WBGT Index °F	Water Intake Quarts/Hour	Work/Rest Cycle-Minutes
1[2]	78°-81.9°	At least 1/2	Continuous
2	82°-84.9°	At least 1/2	50/10
3	85°-87.9°	At least 1	45/15
4	88°-89.9°	At least 1 1/2	30/30
5[3]	90°& above	More than 2	20/40

[1] Preventive Medicine Measures.
[2] MOPP gear or body armor adds at least 10°F to the WBGT Index.
[3] Suspend physical training and strenuous activity. If operational (non-training) mission requires strenuous activity, enforce water intake to minimize expected heat injuries.

A variant of FM 21-10 was also included in the analysis. This variant used the work/rest cycles outlined in Table 3 but instead of implementing one cycle for the entire day (based on the highest predicted WBGT), the work/rest cycle dictated by the existing meteorological conditions was used. For the conditions expected in Southwest Asia (as shown in Table 1), this resulted in continuous work from 0000 to 1100 hours, 45 minutes work/15 minutes rest from 1100 to 1500 hours, 50 minutes work/10 minutes rest from 1500 to 1900 hours, and continuous work from 1900 to 2400 hours. This work discipline provides a higher level of availability than does the prescribed implementation of FM 21-10. It's ability to minimize casualties, however, was unknown at the start of the analysis.

A new work discipline was also examined. This work discipline allowed soldiers to pace themselves over the course of the day, taking care not to allow their core temperatures to exceed a pre-determined level. This work discipline had the advantage of minimizing casualties and, potentially, maximizing availability. In order to keep core temperature below a specified limit, however, a reduction in work intensity might be required. Here, the crucial question was: Would the lower number of casualties make up for any loss of work intensity? Three different core temperature limits were considered: 38°C, 38.5°C and 39°C. This set of disciplines are referred to as the Metabolic Limit Cases.

Finally, a former Army doctrine for work in hot environments was considered. Field Manual 21-40, now obsolete, detailed work/rest cycles for use in such climates. Though no longer in use, this work discipline provided another set of variables to consider in the search for the best work discipline. As with the FM 21-10 prescribed doctrine, two implementations of FM 21-40 were considered. The first assumes the commander has predicted the most severe conditions for the upcoming day and implemented the prescribed work/rest ratio throughout the entire day. A variant on this doctrine assumes the commander dynamically samples the meteorological conditions during the day, changing the work/rest cycles to match the current conditions. Table 4 shows the work/rest doctrine as established in the obsolete FM 21-40.

Table 4. Cyclic Work/Rest Values (Minutes) with Negligible Heat Casualties, FM 21-40.

MOPP[a] LEVEL	WORK RATE	TEMPERATURE RANGES [d]			
		21°C (70°F)	21°-26°C (70°-79°F)	27°-32°C (80°-89°F)	33°C (90°F)
1	LOW	-----[b.]	-----[b.]	-----[b.]	-----[b.]
	MODERATE	-----[b.]	-----[b.]	60/20	40/50
	HEAVY	-----[b.]	60/15	40/25	30/50
2	LOW	-----[b.]	-----[b.]	-----[b.]	50/50
	MODERATE	-----[b.]	-----[b.]	50/35	30/60
	HEAVY	60/30	45/30	25/30	-----[c.]
3	LOW	-----[b.]	-----[b.]	-----[b.]	60/30
	MODERATE	-----[2.]	60/20	40/35	30/50
	HEAVY	40/20	35/30	-----[c.]	-----[c.]
4	LOW	-----[b.]	-----[b.]	40/30	20/50
	MODERATE	40/20	30/25	20/40	-----[c.]
	HEAVY	20/25	-----[c.]	-----[c.]	-----[c.]

a. MOPP levels are based on the protective clothing and equipment worn.
   1. Fatigues with protective mask only.
   2. Fatigues with protective mask, hood, gloves and body armor.
   3. Overgarment over fatigues or fatigues over protective liner.
   4. Level 3 with addition of mask, hood, gloves and body armor.

b. Under these conditions, any reasonable work/rest periods will suffice to prevent heat casualties.

c. Under these conditions, work time will be severely limited and even very short periods of heavy work could result in heat casualties.

d. Well trained (acclimated) troops will require shorter and less frequent rest periods than poorly trained troops.

The eight work disciplines examined in this study are listed in Table 5.

Table 5.	Work Disciplines Used In Study.
1	Continuous Work
2	Work/Rest Cycles from FM 21-10
3	Metabolic Limit at 39°C
4	Metabolic Limit at 38.5°C
5	Metabolic Limit at 38°C
6	Work/Rest Cycles from FM 21-40
7	FM 21-10 Variant
8	FM 21-40 Variant

5.5 WORK INTENSITY

The intensity of the work performed has a significant impact on an individual's core temperature. Six levels of work intensity (metabolic rates) were examined: 105, 150, 300, 400, 500 and 600 Watts. 105 Watts is equivalent to the metabolic rate seen when resting.

5.6 SUMMARY OF STUDY PARAMETERS

Table 6 lists the significant study parameters used for this analysis.

Table 6. Study Parameters	
Level of Acclimatization (Days)	0 4 8 12
Level of Dehydration (%)	0 2 4 6
Metabolic Rate (Watts)	105 150 300 400 500 600
Clothing Worn	BDU BDO BDO over BDU
Work Disciplines	Continuous Work FM 21-10 Met. Limit at 39°C Met. Limit at 38.5°C Met. Limit at 38°C FM 21-40 FM 21-10 Variant FM 21-40 Variant

6. RESULTS

6.1 BACKGROUND

In the course of this analysis, 2304 input sets and computer runs were completed. The resulting data included core temperature profiles, probability of casualty predictions, availability estimates and productivity approximations. This section of the report will be devoted to presenting a representative sample of this data but a full listing of the data generated can be found in Appendix D.

6.2 CORE TEMPERATURE PREDICTIONS

A major output of the SAIC implementation of the Goldman-Givonni model is a table listing predicted core temperature as a function of time. Figures 2 through 5 show the core temperature profiles for four of the work disciplines considered. The case shown examined a working metabolic rate of 400 Watts, unacclimatized troops at 2% dehydration and BDU's. Note, each graph shows the profile for a six hour period during the day.

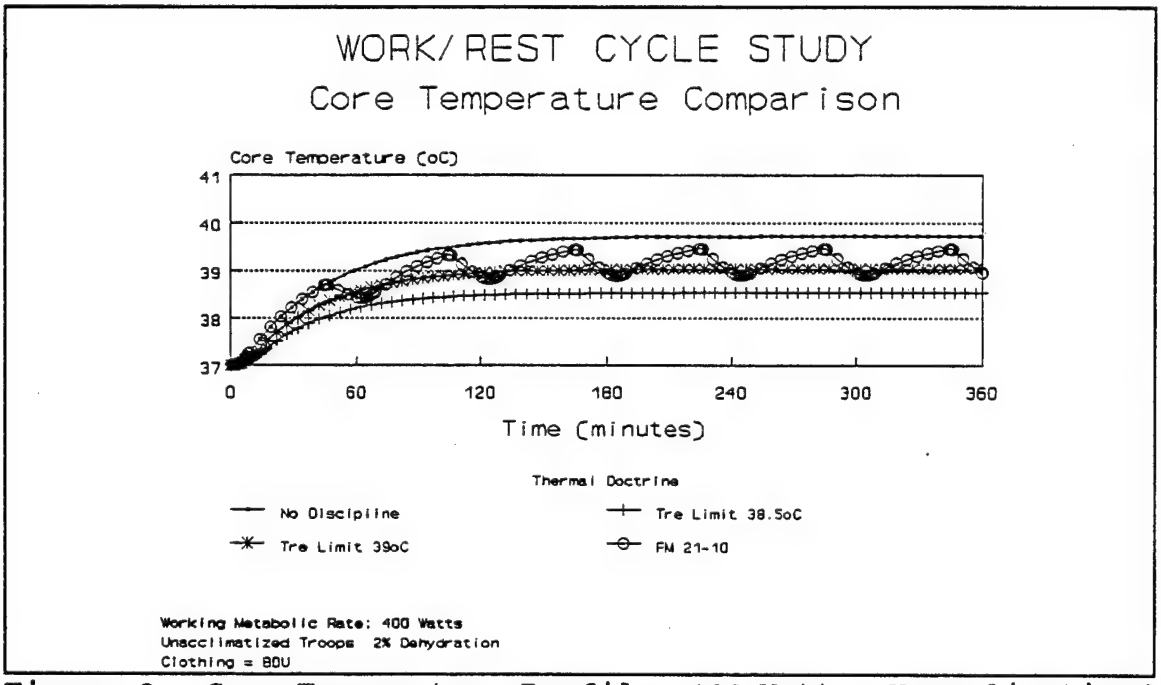

Figure 2. Core Temperature Profile, 400 Watts, Unacclimatized Troops at 2% Dehydration, BDUs, Part 1.

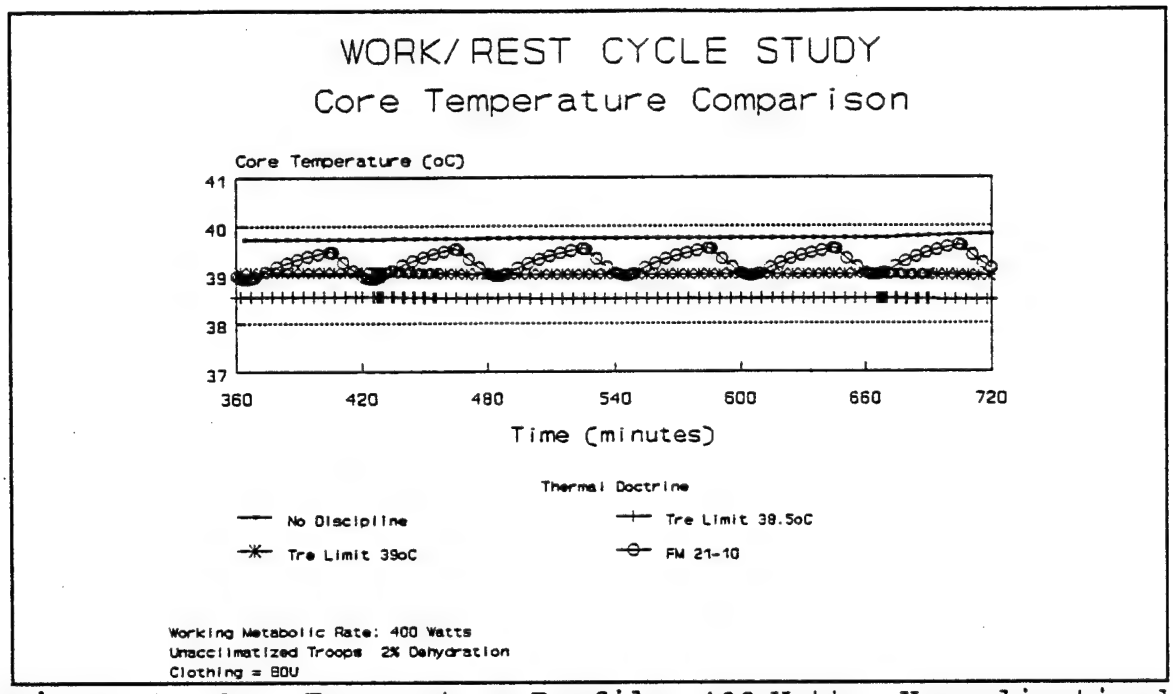

Figure 3. Core Temperature Profile, 400 Watts, Unacclimatized Troops at 2% Dehydration, BDUs, Part 2.

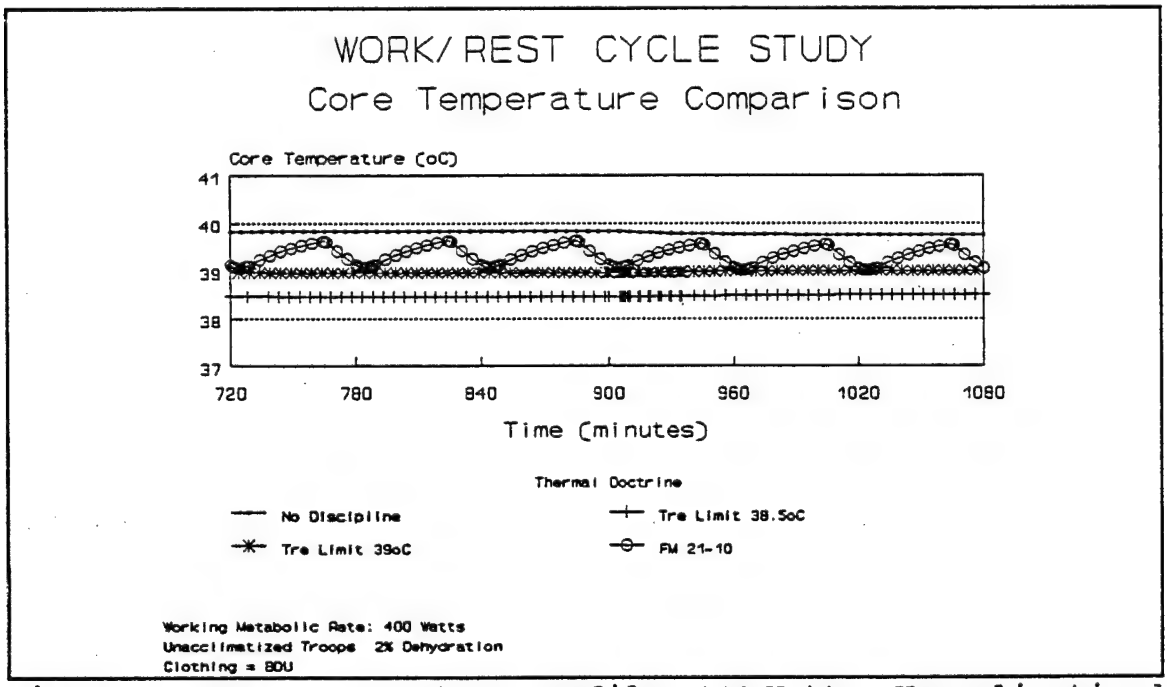

Figure 4. Core Temperature Profile, 400 Watts, Unacclimatized Troops at 2% Dehydration, BDUs, Part 3.

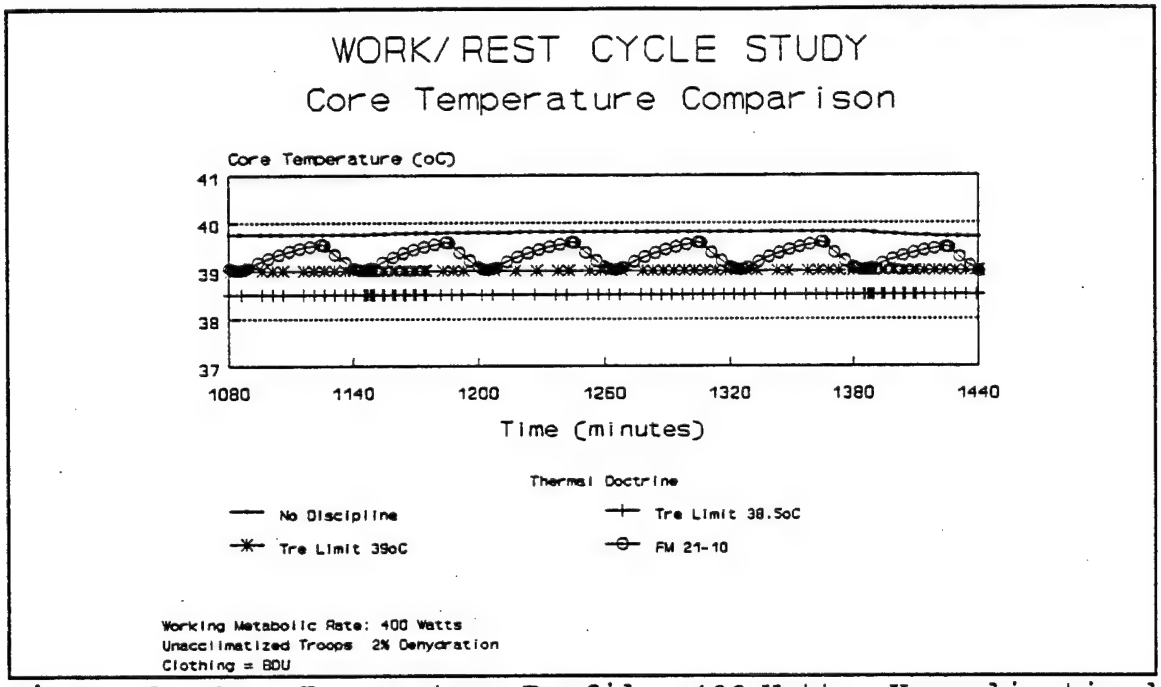

Figure 5. Core Temperature Profile, 400 Watts, Unacclimatized Troops at 2% Dehydration, BDUs, Part 4.

As expected, continuous work (denoted as No Discipline) resulted in the highest core temperature profile seen for these conditions. The work/rest ratios as specified in FM 21-10 produce the desired drop in core temperature during rest periods but come perilously high during work periods. Both metabolic limit cases (denoted as Tre (Rectal Temperature) Limit 38.5°C and 39°C) show the desired result of leveling off at the specified core temperature limit.

Figures 6 through 13 show the same information for fully acclimatized troops at 2% and 6% dehydration, respectively. These graphs suggest the current doctrine on work/rest is not sufficient to keep core temperature, and therefore casualties, within acceptable limits.

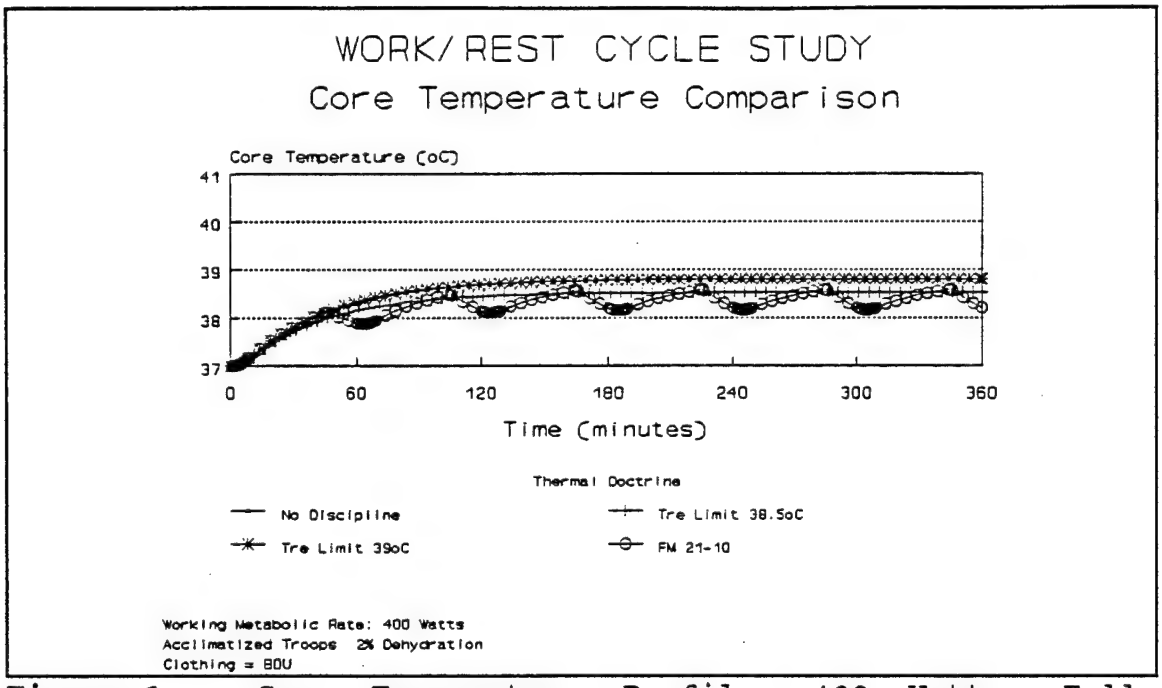

Figure 6. Core Temperature Profile, 400 Watts, Fully Acclimatized Troops at 2% Dehydration, BDUs, Part 1.

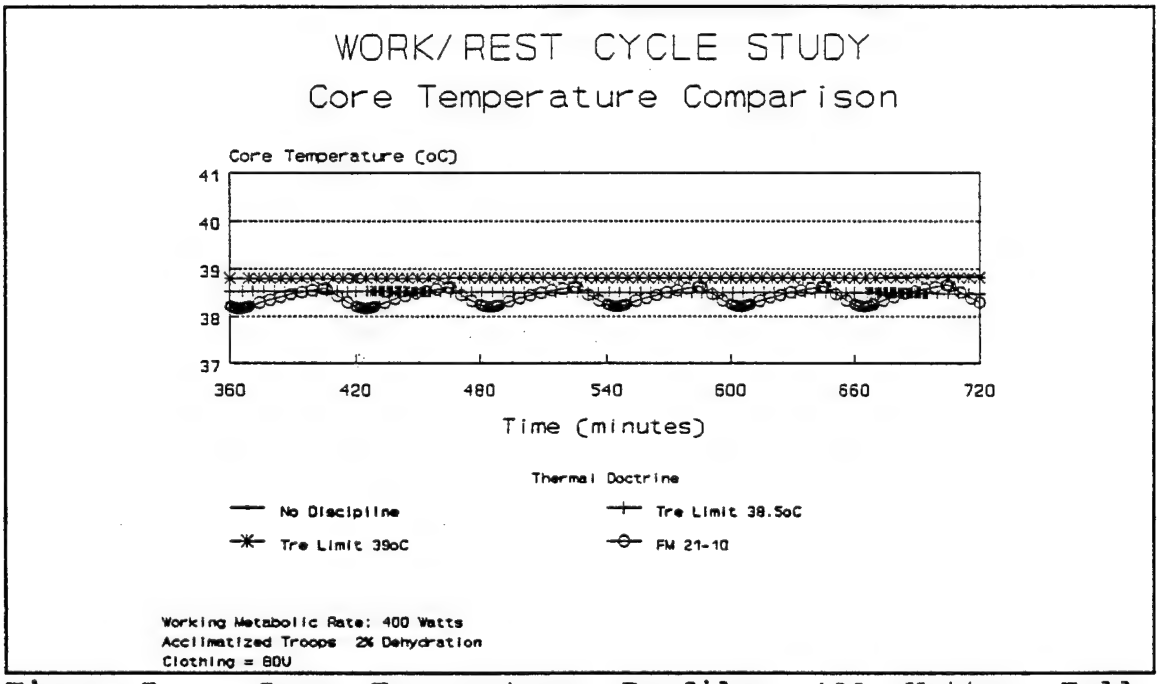

Figure 7. Core Temperature Profile, 400 Watts, Fully Acclimatized Troops, at 2% Dehydration, BDUs, Part 2.

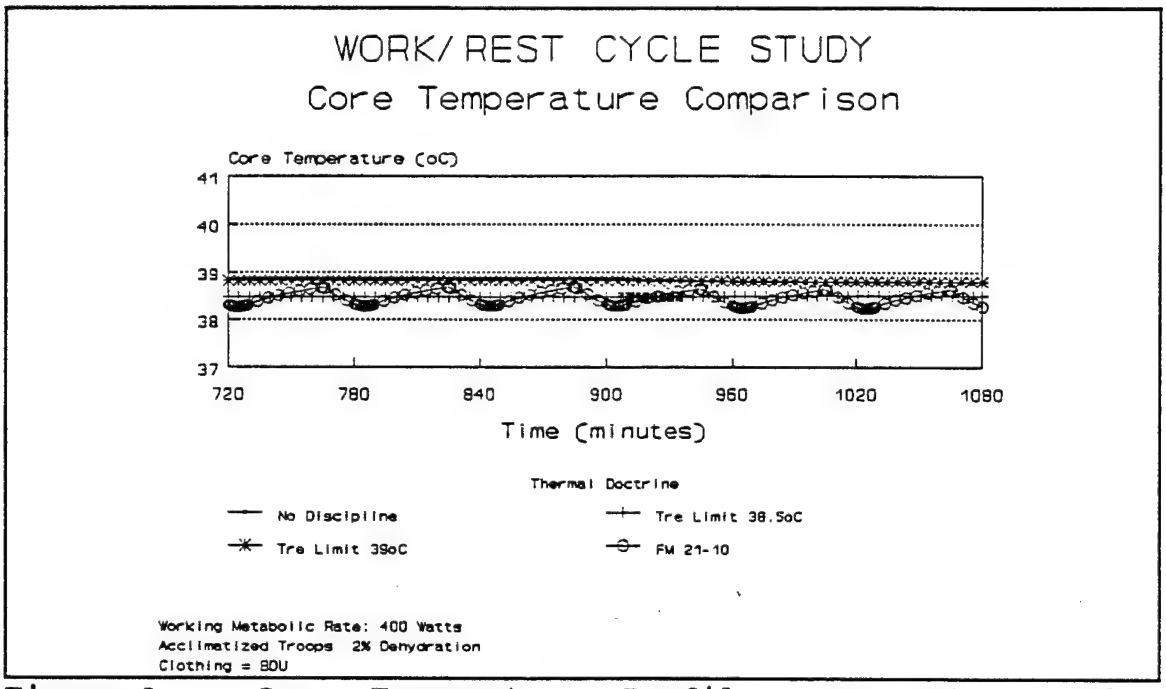

Figure 8. Core Temperature Profile, 400 Watts, Fully Acclimatized Troops at 2% Dehydration, BDUs, Part 3.

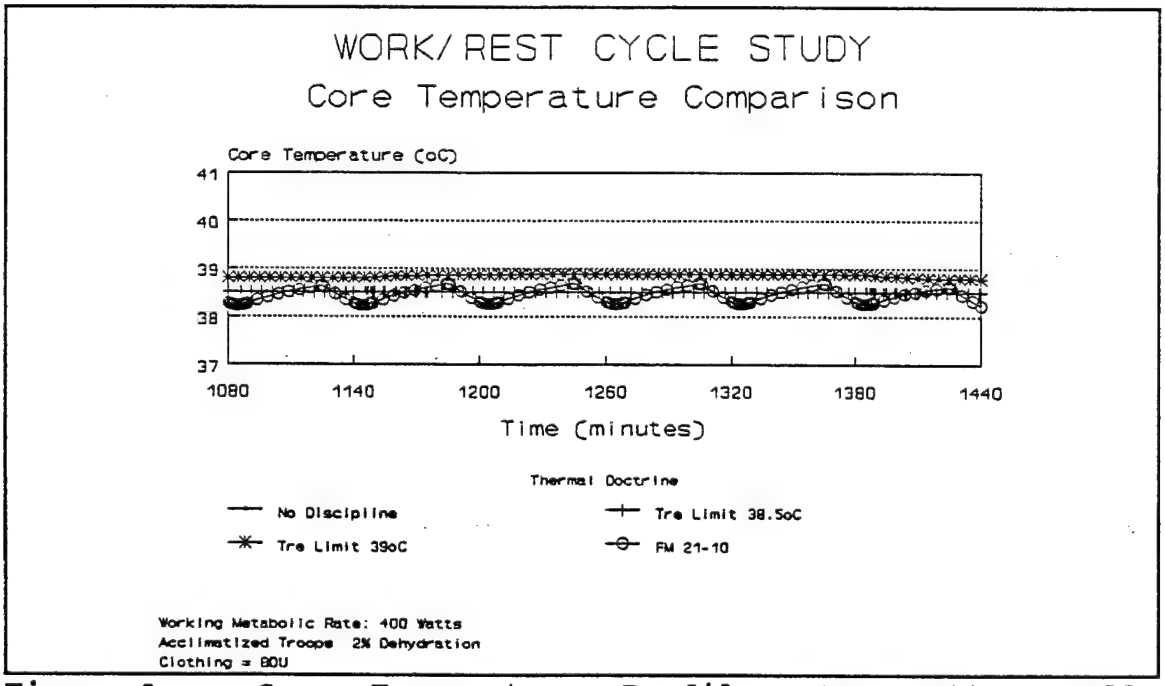

Figure 9. Core Temperature Profile, 400 Watts, Fully Acclimatized Troops at 2% Dehydration, BDUs, Part 4.

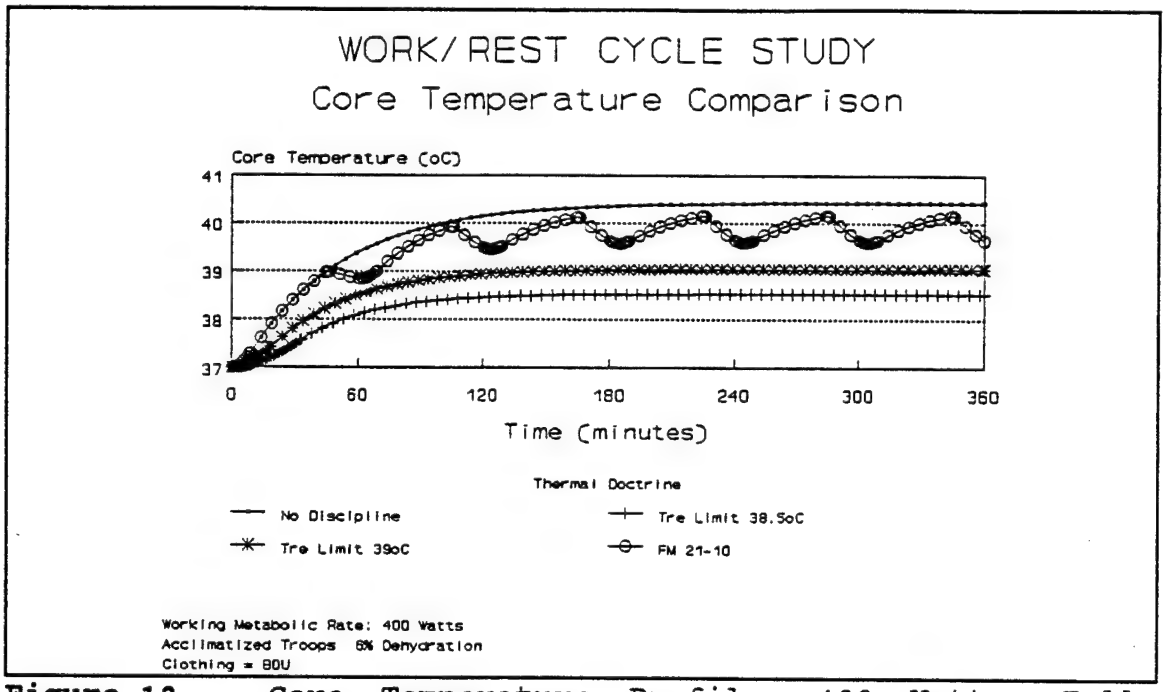

Figure 10. Core Temperature Profile, 400 Watts, Fully Acclimatized Troops at 6% Dehydration, BDUs, Part 1.

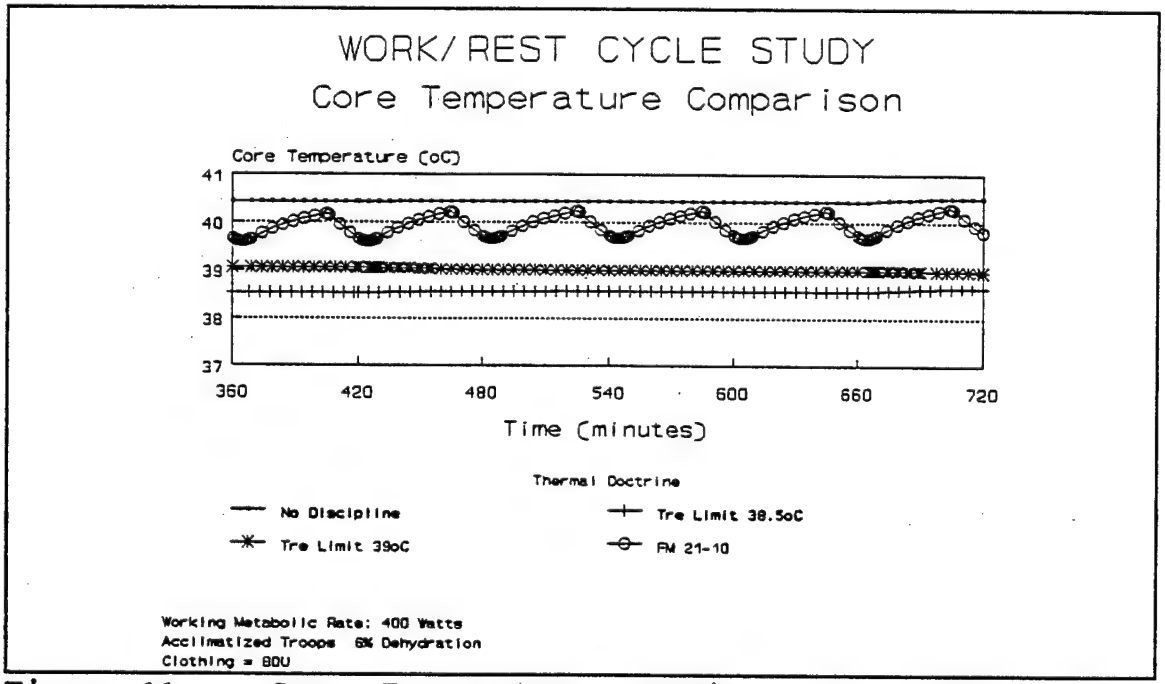

Figure 11. Core Temperature Profile, 400 Watts, Fully Acclimatized Troops at 6% Dehydration, BDUs, Part 2.

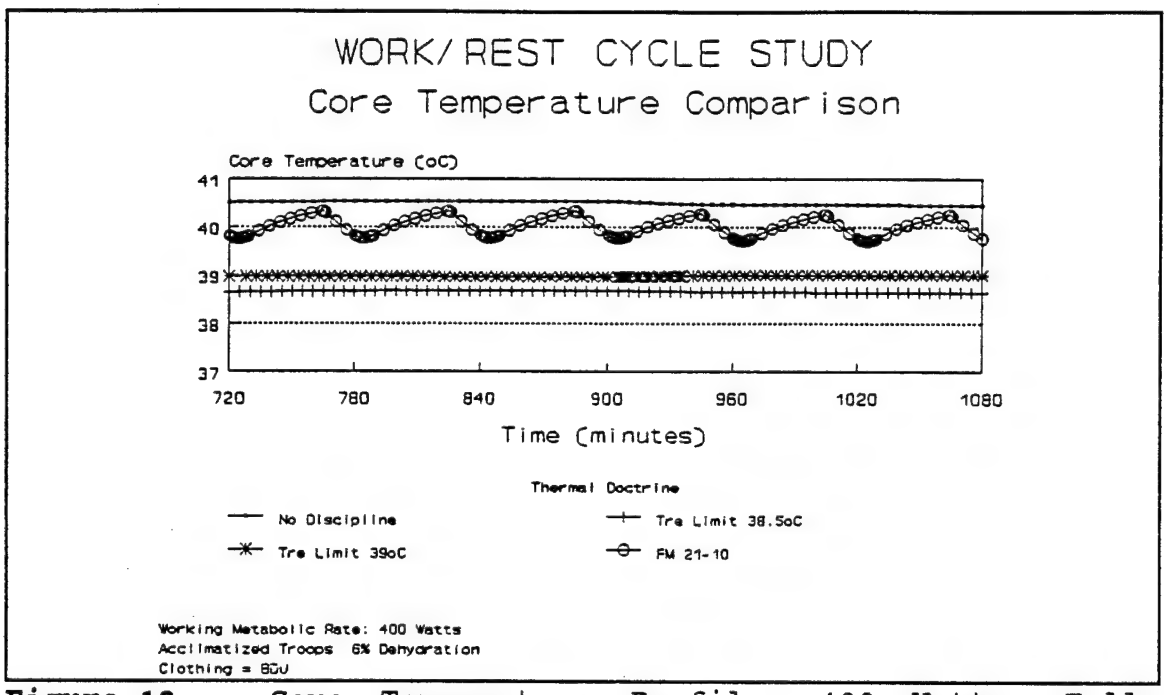

Figure 12. Core Temperature Profile, 400 Watts, Fully Acclimatized Troops at 6% Dehydration, BDUs, Part 3.

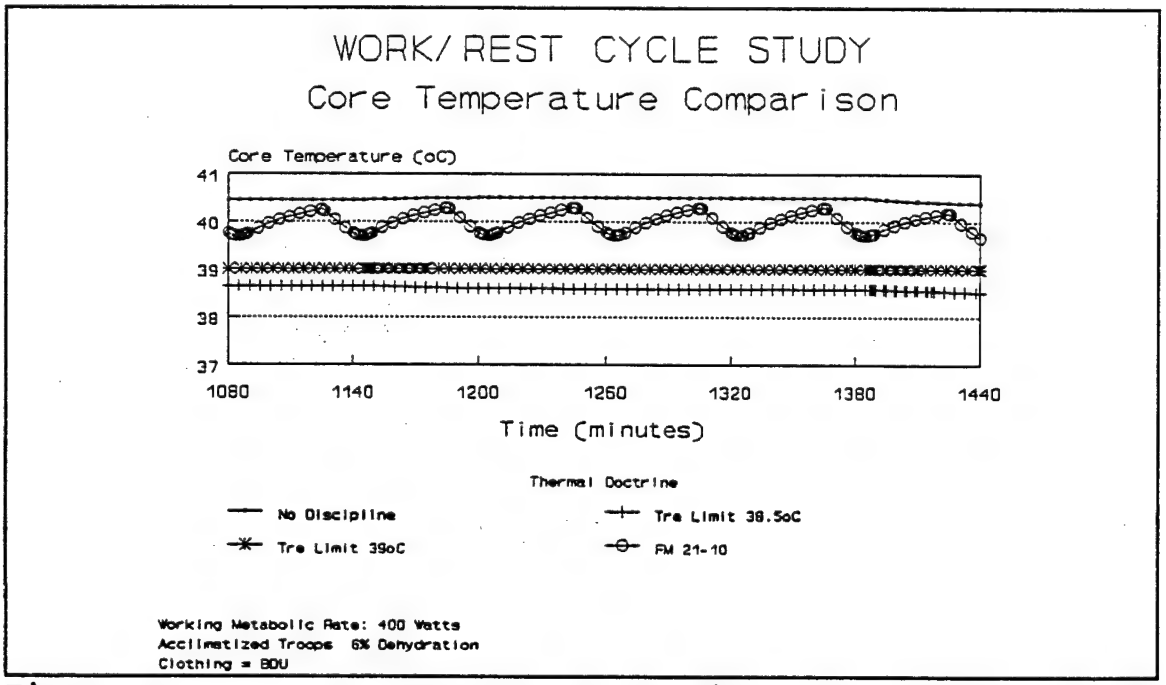

Figure 13. Core Temperature Profile, 400 Watts, Fully Acclimatized Troops at 6% Dehydration, BDUs, Part 4.

6.3 LEVEL OF CASUALTIES

As explained earlier in this report, the SAIC implementation of the Goldman-Givoni model determines a probability of casualty based on the highest core temperature achieved during the day. Figures 14 through 16 show expected casualties for selected cases implementing FM21-10 work/rest cycles. Three different levels of work intensity are shown (150, 400 and 600 Watts) for the three clothing types considered. Values are given for two levels of acclimatization: fully acclimatized troops or unacclimatized troops.

Notice that at the higher work intensities (400 and 600 Watts), the probability of casualty associated with the wearing of the Battle Dress Overgarment over underwear (BDO4) is lower than it is for those wearing the Battle Dress Uniform (BDU). While this is surprising at first, it turns out to be a result of implementing different work/rest ratios. While in BDUs, troops are directed to work 45 minutes and rest 15 minutes under the existing meteorological conditions. While in chemical protective gear (BDO4 or BDU + BDO4), the prescribed ratio is 20 minutes of work and 40 minutes of rest. Despite the fact that the BDO4 ensemble is more thermally restrictive than BDUs, the change in work/rest ratios resulting in a reduced probability of casualty.

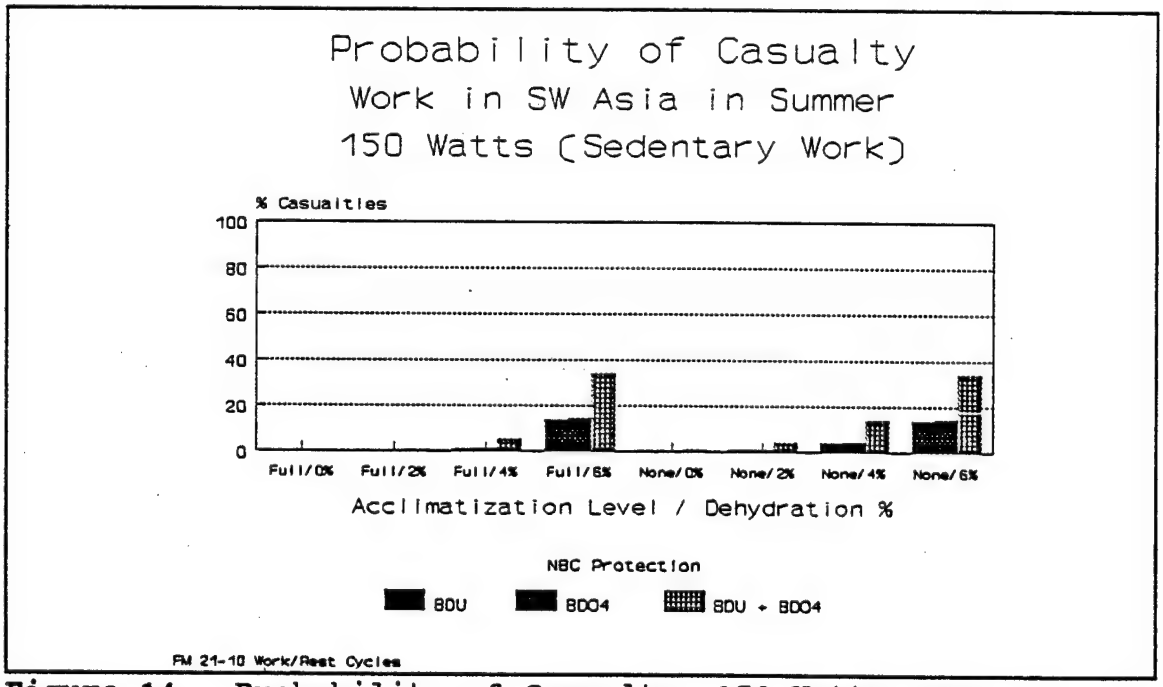

Figure 14. Probability of Casualty, 150 Watts, FM21-10.

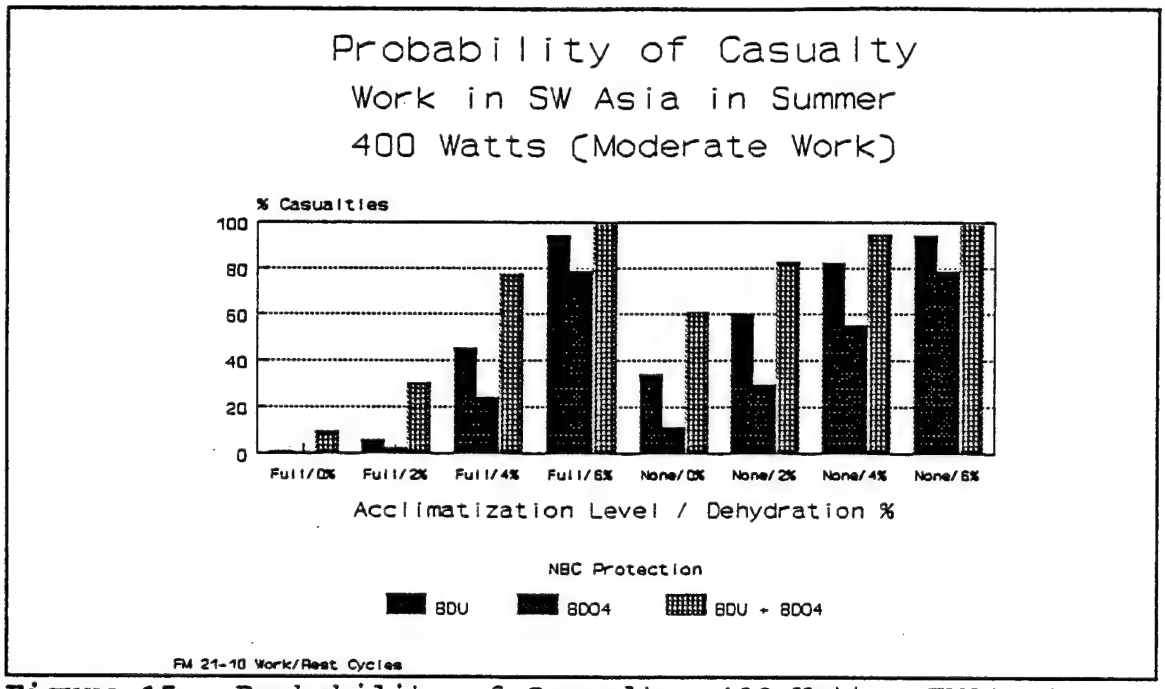

Figure 15. Probability of Casualty, 400 Watts, FM21-10.

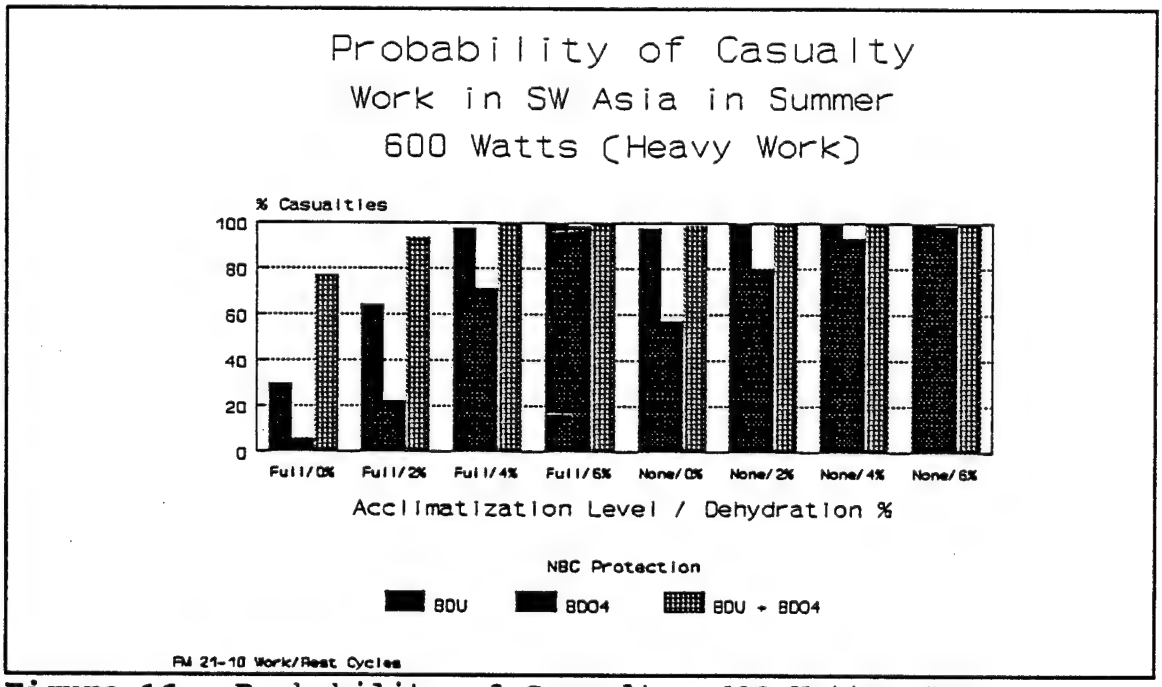

Figure 16. Probability of Casualty, 600 Watts, FM21-10.

6.4 AVAILABILITY VERSUS CASUALTIES

Keeping thermal casualties to a minimum in the field is only one side of the coin. The other is maintaining an acceptable level of availability on the battlefield. While continuous rest will likely avoid all casualties, it certainly does not provide an acceptable level of availability.

The Continuous Work discipline (labeled No W/R) provides 100% availability since there is no superimposed restriction on duty time. This does not suggest that troops will, in fact, be able to work 100% of the time, however. Continuous work can result in a large number of casualties and still show 100% availability. The next section of the results will take both availability and casualties and determine the productivity of the unit, ie. availability X survivors.

Availability for the different work/rest disciplines (FM21-10, FM21-40 and their variants) was determined by using a weighted average of the amount of work time over the total amount of time during the day. For the Metabolic Limit cases, an algorithm was developed to estimate availability:

If

$$MR_{Limited} \geq MR_{Initial} \text{ then } AV = 1$$

Else if

$$MR_{Limited} \leq 105, \text{ then } AV = 0,$$

Else

$$AV = \frac{MR_{Limited} - 105}{MR_{Initial} - 105}.$$

Where,

$MR_{Limited}$ = *Metabolic rate limited by maintaining core temperature at/below specified value.*

$MR_{Initial}$ = *Metabolic rate initially required for job.*

AV = Availability.

105 = *Resting metabolic rate.*

for each of the required jobs for each time period (ie. set of met conditions) during the day.

Figures 17 through 24 show availability and casualties for each of the eight work disciplines examined under selected conditions. Two graphs were required to show all eight work disciplines. Note that Figures 17 through 22 show results for BDUs while Figures 23 and 24 illustrate the consequences of wearing BDO4.

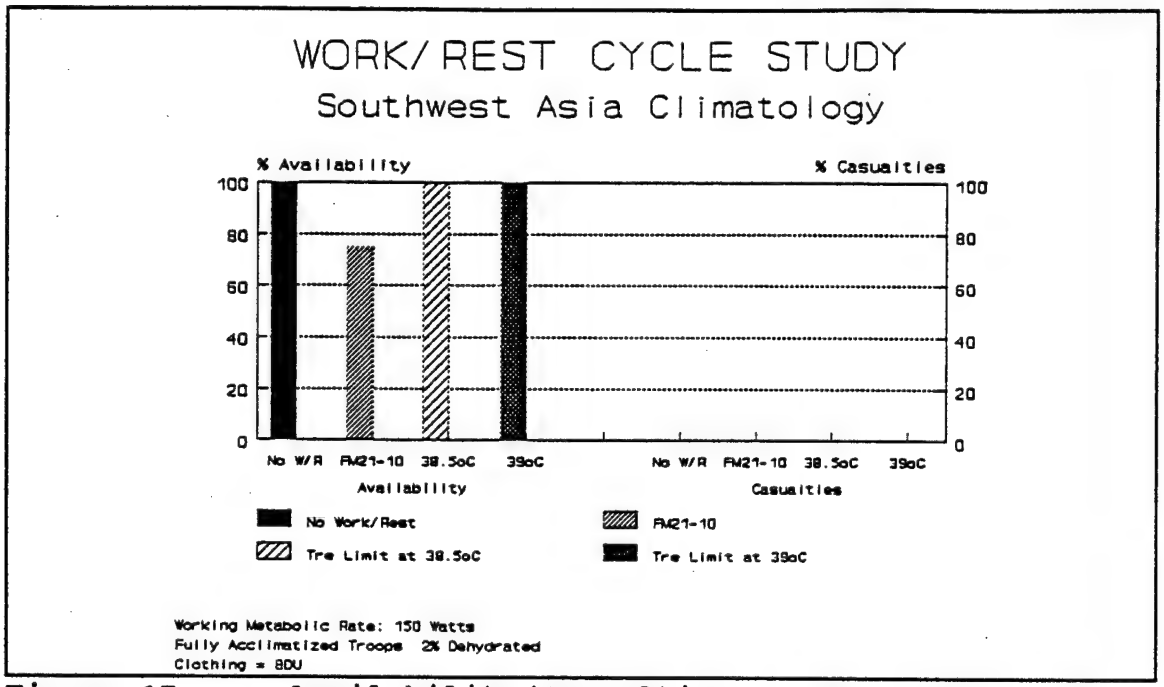

Figure 17. Availability/Casualties, 150 Watts, Fully Acclimatized Troops at 2% Dehydration, BDUs, Part 1.

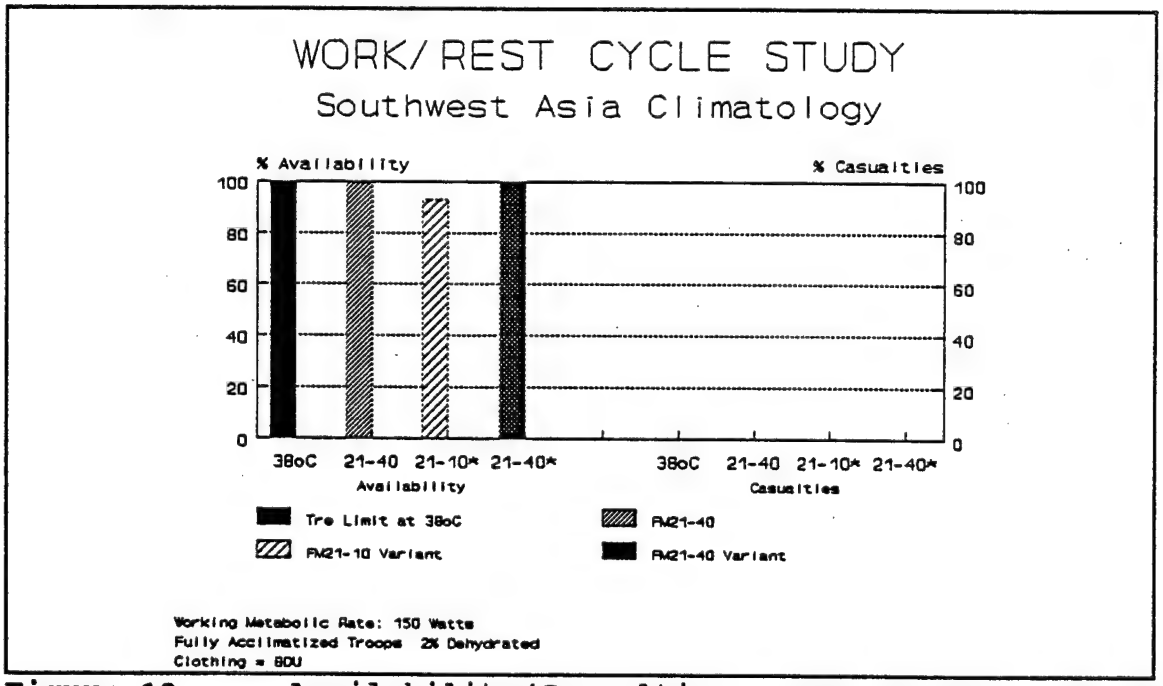

Figure 18. Availability/Casualties, 150 Watts, Fully Acclimatized Troops at 2% Dehydration, BDUs, Part 2.

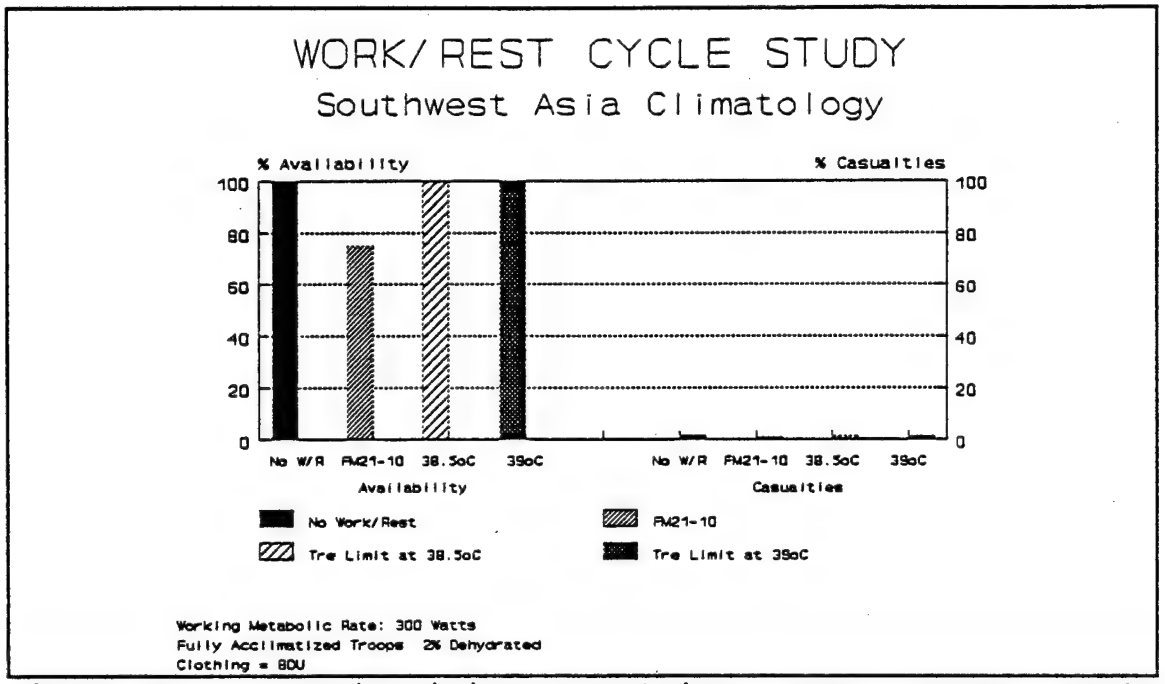

Figure 19. Availability/Casualties, 300 Watts, Fully Acclimatized Troops at 2% Dehydration, BDUs, Part 1.

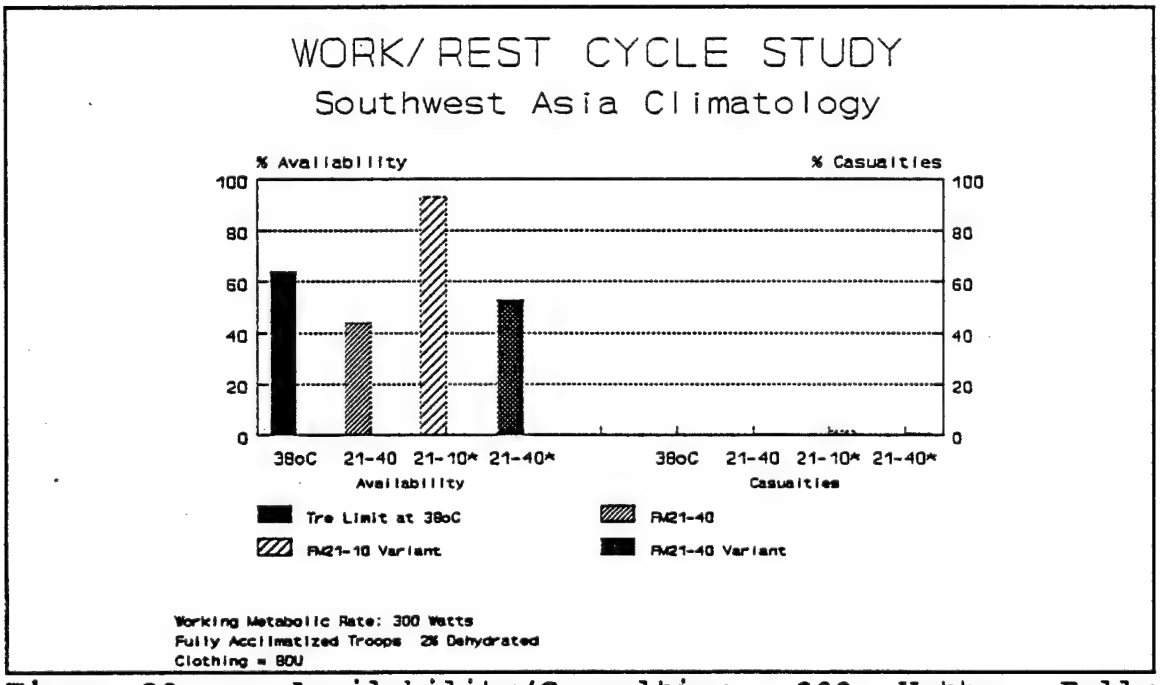

Figure 20. Availability/Casualties, 300 Watts, Fully Acclimatized Troops at 2% Dehydration, BDUs, Part 2.

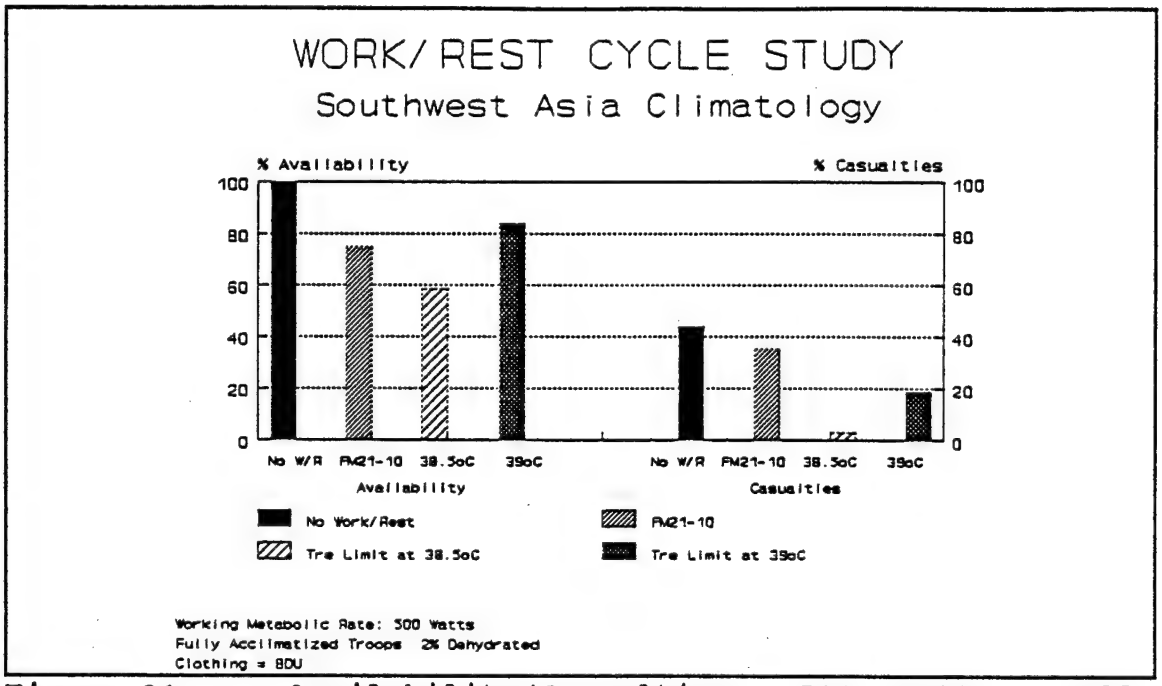

Figure 21. Availability/Casualties, 500 Watts, Fully Acclimatized Troops at 2% Dehydration, BDUs, Part 1.

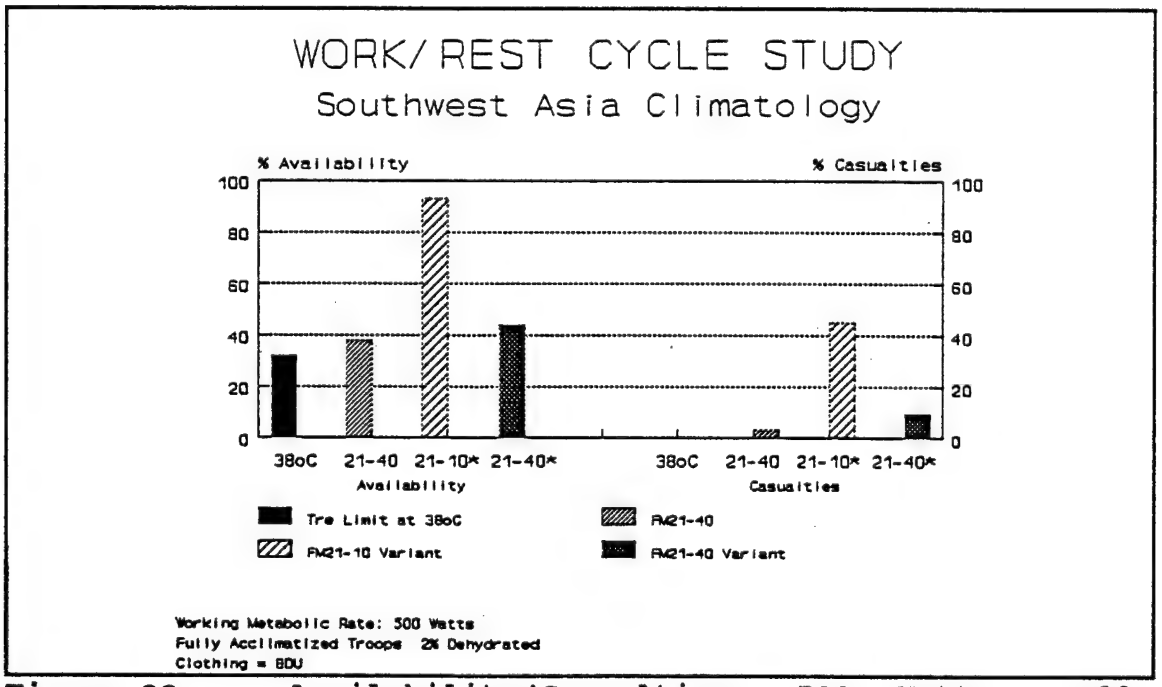

Figure 22. Availability/Casualties, 500 Watts, Fully Acclimatized Troops at 2% Dehydration, BDUs, Part 2.

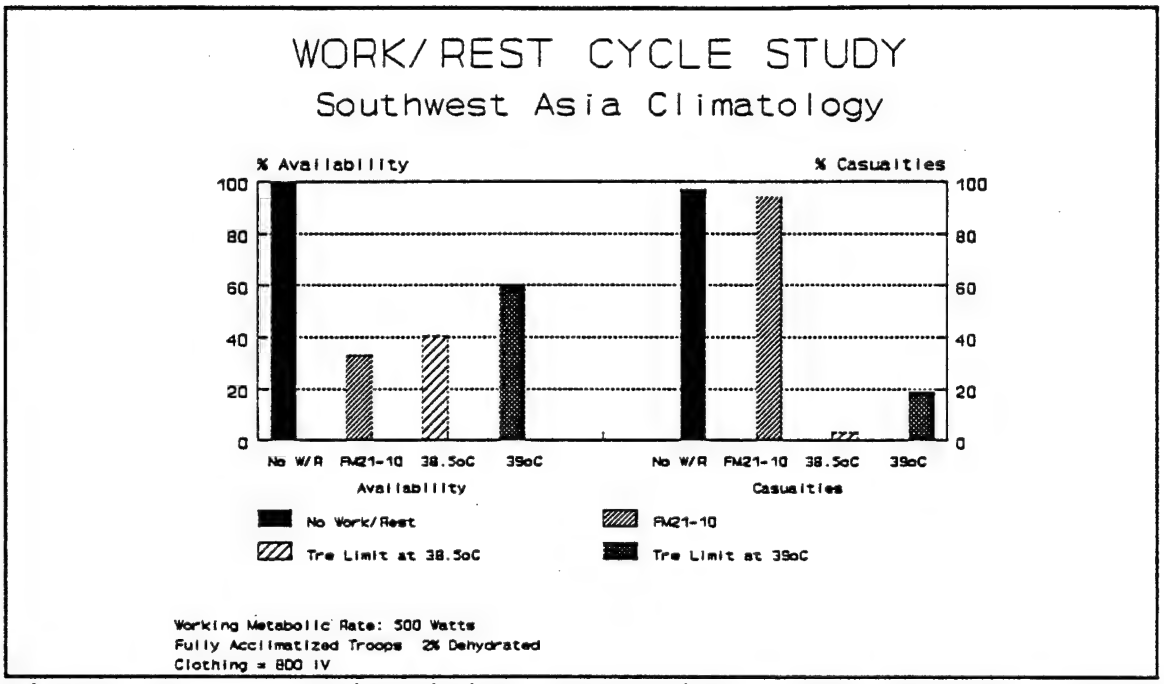

Figure 23. Availability/Casualties, 500 Watts, Fully Acclimatized Troops at 2% Dehydration, BDO4, Part 1.

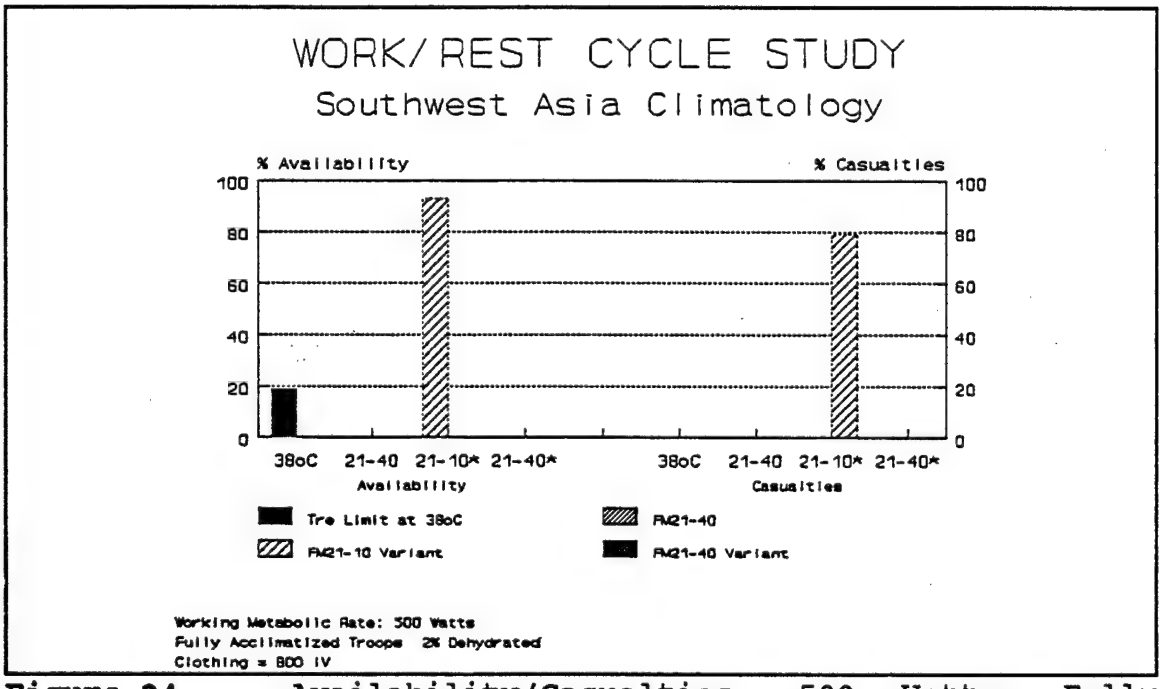

Figure 24. Availability/Casualties, 500 Watts, Fully Acclimatized Troops at 2% Dehydration, BDO4, Part 2.

6.5 PRODUCTIVITY

Productivity is the bottom line measure of performance. Productivity is defined as the product of the availability afforded by a particular work discipline and the number of survivors of this discipline. While availability of 100% makes continuous work attractive, a high level of casualties forces us to look for other alternatives. In this case, productivity would be low.

Figures 25 through 27 show productivity for each clothing combination, each work discipline and each level of work intensity. The value shown is an average of all hydration and acclimitization states.

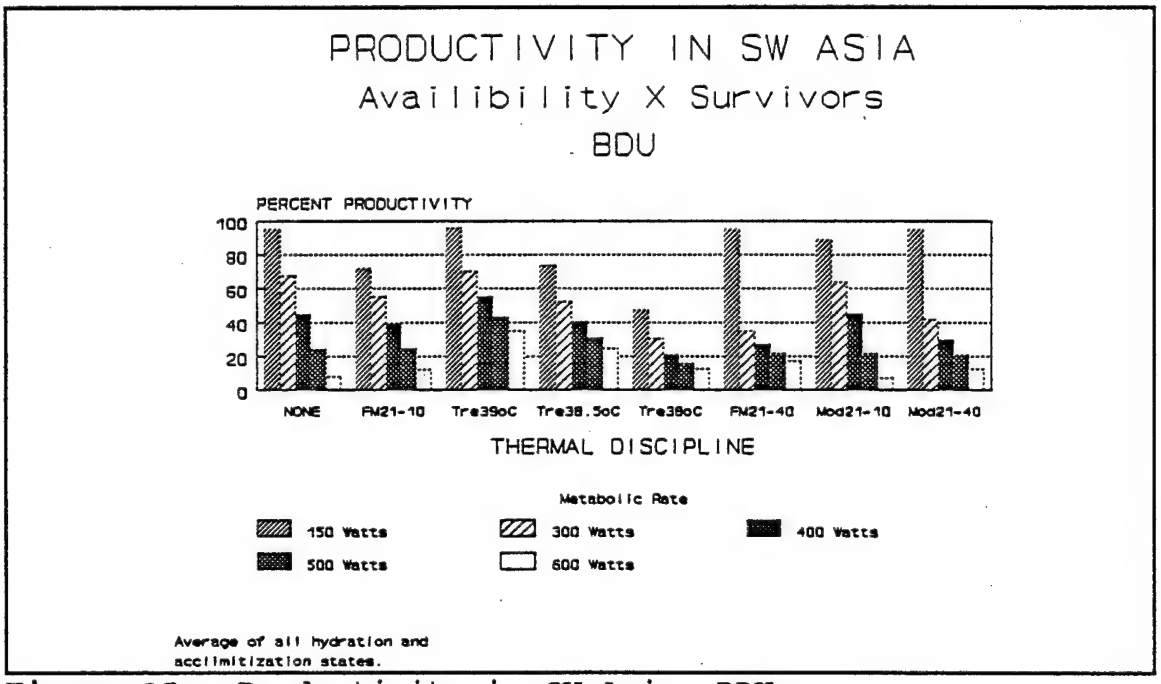

Figure 25. Productivity in SW Asia, BDUs.

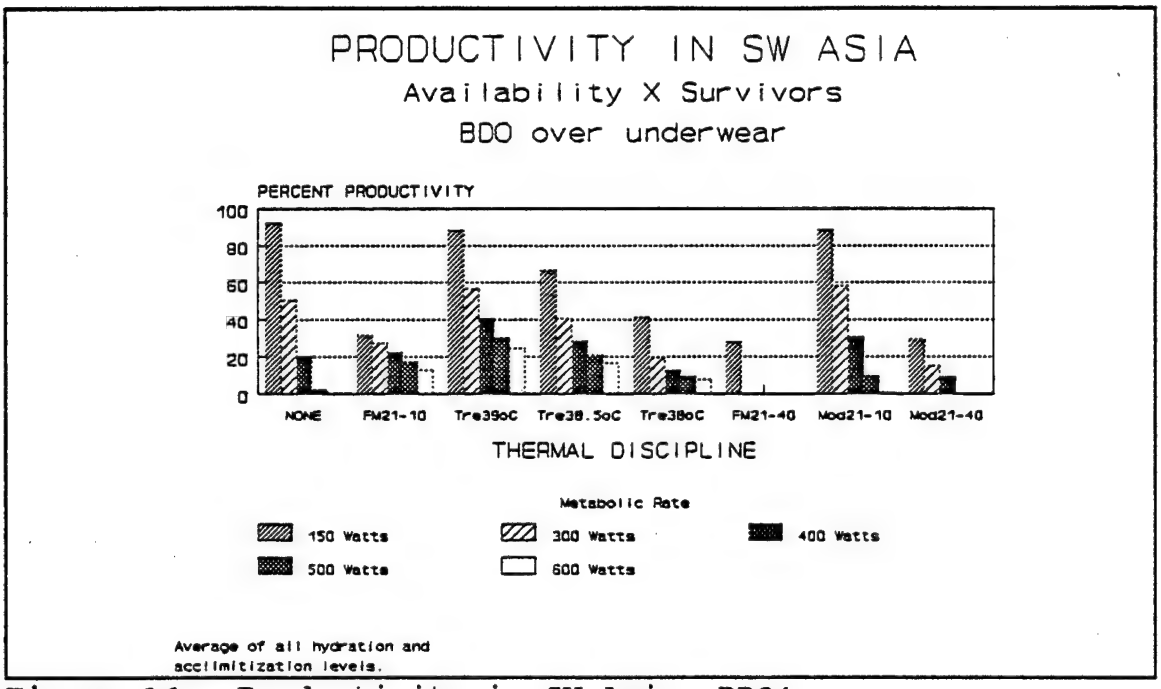

Figure 26. Productivity in SW Asia, BDO4.

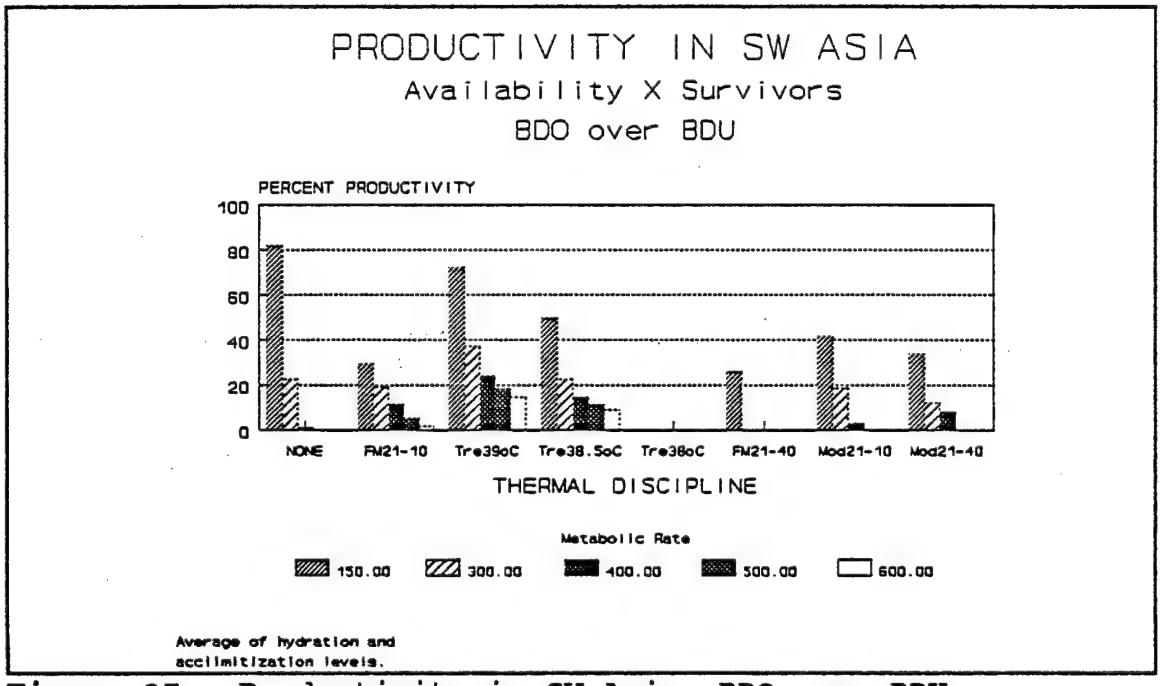

Figure 27. Productivity in SW Asia, BDO over BDU.

The results presented so far have only been a sample of the data generated. An extensive statistical analysis of all the data was completed for this study and a portion of the statisitical analysis is available for examination in APPENDIX E. Tables 7 through 11 contain the general characteristics of the productivity calculations for the 2304 cases.

Table 7. Productivity by Levels of Work Discipline

Work Discipline	Number of Cases	Mean	Standard Deviation
1. Continuous Work	288	44.35	43.52
2. FM21-10	288	37.13	33.78
3. Metabolic Limit at 39°C	288	55.20	35.78
4. Metabolic Limit at 38.5°C	288	43.90	40.15
5. Metabolic Limit at 38°C	288	30.32	39.78
6. FM21-40	288	29.88	37.86
7. FM21-10 Variant	288	42.61	40.47
8. FM21-40 Variant	288	33.12	36.65

Table 8. Productivity by Levels of Demanded Metabolic Rate.

Demanded Metabolic Rate (Watts)	Number of Cases	Mean	Standard Deviation
105	384	96.01	6.70
150	384	61.91	36.40
300	384	34.28	32.00
400	384	22.24	26.41
500	384	13.83	20.05
600	384	9.12	14.75

Table 9. Productivity by Levels of Clothing Type.			
Clothing Type	Number of Cases	Mean	Standard Deviation
BDU	768	52.07	38.65
BDO4	768	38.09	39.27
BDO4 over BDU	768	28.53	36.63

Table 10. Productivity by Levels of Acclimatization.			
Days of Acclimatization	Number of Cases	Mean	Standard Deviation
0	576	33.65	38.47
4	576	39.45	39.32
8	576	41.95	39.62
12	576	43.21	39.55

Table 11. Productivity by Levels of Dehydration.			
Dehydration (%)	Number of Cases	Mean	Standard Deviation
0	576	54.77	37.81
2	576	46.29	38.82
4	576	34.14	38.81
6	576	23.05	34.52

Figures 28 and 29 show the productivity values for each work discipline and the differences in these values as compared to current doctrine, FM21-10. The metabolic limit at 39°C case is clearly the best of the disciplines examined, providing almost a 25% increase in productivity over the next best alternative examined (continuous work). When only the more severe cases of low acclimatization and hydration are examined, this difference is even more dramatic.

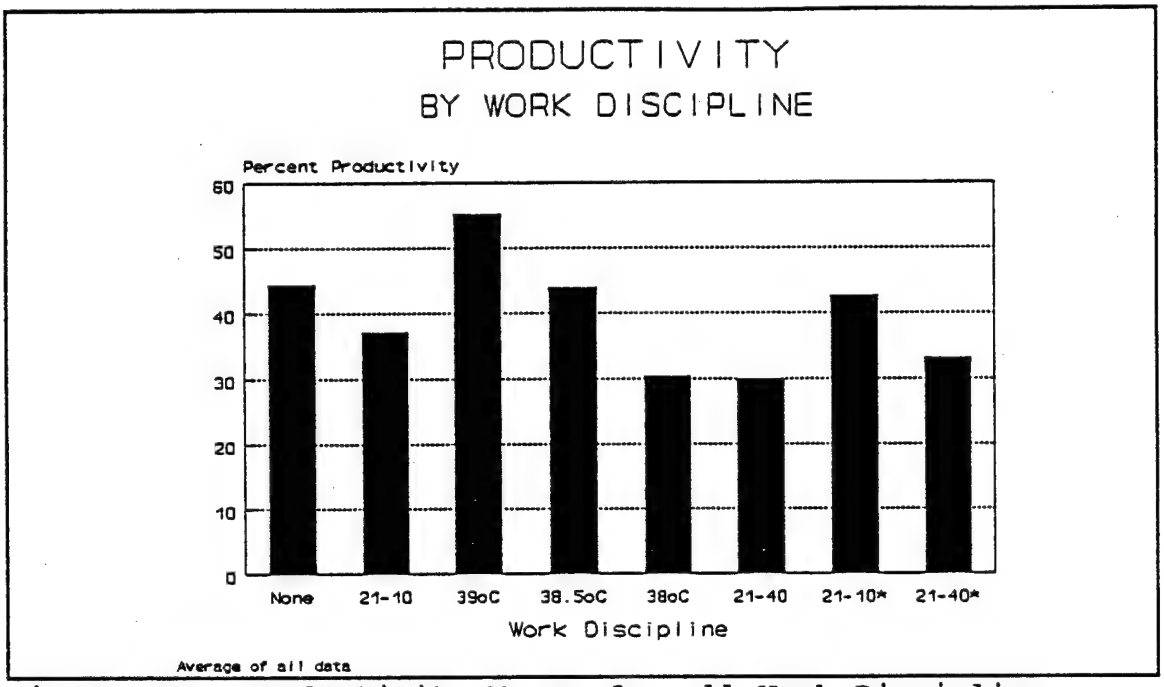

Figure 28. Productivity Means for all Work Disciplines.

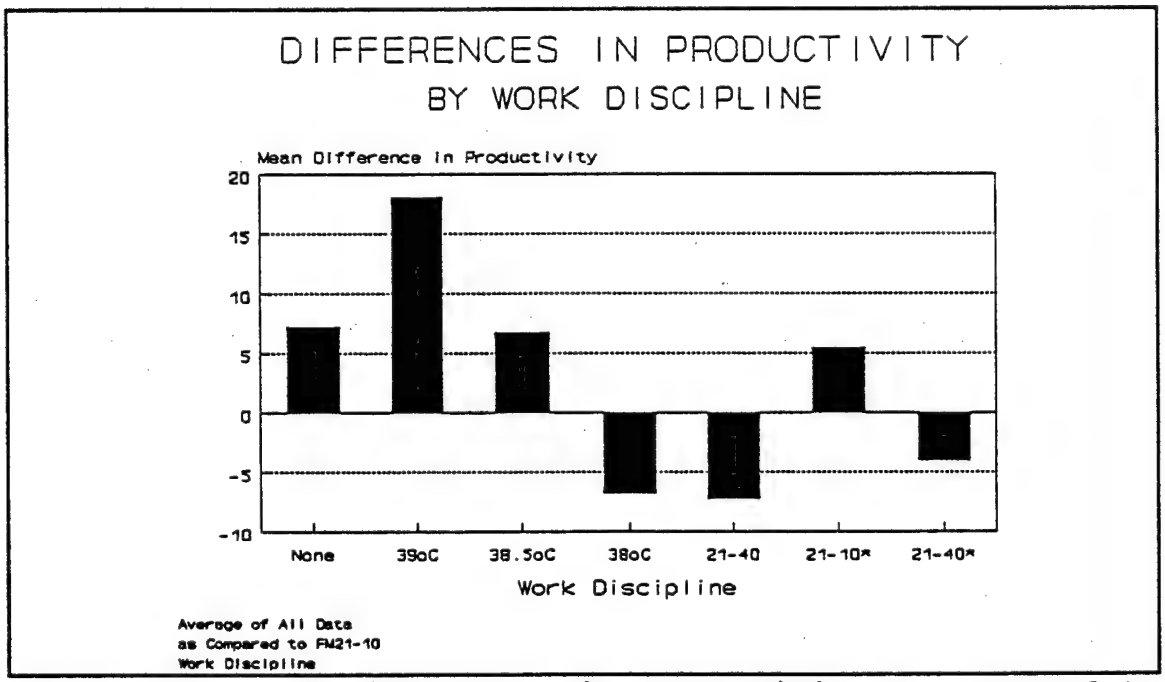

Figure 29. Mean Differences in Productivity as Compared to FM21-10 Work Discipline.

7. CONCLUSIONS

Three distinct approaches to continuous operations in a hot environment were examined in this report. The first approach, continuous work, reflects a philosophy embodied by the concept that "my people are tough" and ignores physiological reality. This concept was found to work only at the lowest work rates in the hot environment of Southwest Asia in the summer. As the work rate reaches moderate to high levels, the large number of casualties resulted in dramatic lost productivity.

The second approach, work/rest cycles, reflects a philosophy that time-averaged metabolic rates can be used to lower the risk of casualty inherent in continuous work regimens. Four different work/rest disciplines were examined based on tables produced by FM21-10 and FM21-40. FM21-10 is based on WBGT levels and specifies that the values are appropriate for acclimatized, well hydrated, moderate workload tasks. FM21-40 is based on ambient temperature (i.e. dry bulb temperature), workload categories (light, moderate, heavy) and specifies that the values are only appropriate for acclimatized and well hydrated individuals. While the work/rest cycles severely restricted the amount of time spent working, casualties could become prohibitively high in conditions where the workload was high, dehydration was experienced, or acclimatization was less than optimal. The work/rest disciplines associated with both field manuals resulted in many situations in protective equipment that no work could be performed. The guidelines for using these work/rest cycles state that the anticipated highest temperature of the day should be used throughout the day. A modified applications of the work/rest cycles used the tabulated values for the "actual" meteorological values presented throughout the day. This approach was based on the philosophy of tailoring the work/rest cycles more appropriately to the conditions. The changes during the day avoided highly restrictive work/rest cycles during the less thermally stressful times of the day. This modified application of the work/rest discipline did result in marginally increased productivity with similar casualties to the casualty levels resulting from the baseline work/rest discipline.

The third approach, metabolic or core temperature limits, reflects a philosophy of facilitating continuous work, but at a lower work rate. This approach parallels empirical observations on the successful adaptations of people working in a hot environment. Three different implementations, limiting the highest core temperature to 39°C, 38.5°C, and 38°C during work, resulted in dramatic reduction in the number of casualties expected in all conditions. Productivity was maintained at the highest level (for the 39°C case) of all other disciplines examined while casualties were restricted to approximately 18%,

3%, and 0.3% respectively for the three implementations. While some of the conditions examined in this study required periods of no work potential, the 39°C was able to extend productive performance to dehydration, acclimatization, and clothing combinations which caused 100% casualties with other alternatives.

A thermal discipline based on the metabolic limit approach offers a real opportunity to reduce the risk of high casualties from operations in the hot environment characteristic of Southwest Asia in the summer. The metabolic limit approach has the additional advantage that the impact of different levels of acclimatization, dehydration, workload, and clothing can be considered within a simple (not simplistic) thermal guidance. In addition to reducing the risk of high casualties, this class of thermal discipline appears to lead to optimizing productivity. This approach can and should be implemented into a tactical decision aid which could be used to produce operational and tactical plans and decisions with realistic expectations. For instance, if a fixed number of rounds must be put on a particular target in a particular amount of time, the mission planner could use a tactical decision aid based on metabolic rate to identify how many tubes (functioning at a rate which is consistent with the maximum metabolic rate for the conditions) must be brought to bear on the target. The fire plan could then be issued for a particular number of rounds fired by a certain number of tubes at a specified firing rate which would not require the personnel in the firing unit to become thermal casualties.

8. RECOMMENDATIONS

The current implementation of Goldman-Givoni model has not been systematically and rigorously validated against field data. Certain characteristics of the Goldman-Givoni model make such a validation effort essential if simulation is to be used to determine optimal thermal disciplines and tactical decision aides. Questions that must be evaluated include the baseline core temperature for people acclimatized to work in a hot environment (the current model results show that the resting core temperature in hot environments is raised beyond thermo-neutral levels), a non-variant skin temperature over the course of hard work in a variety of clothing, and individual differences in core temperature. Although the best alternatives found in this study used the concept of slowing down the rate of work to accomplish a task more safely, the tactical and operational feasibility of developing this strategy should be tested and compared with work/rest strategies and the physiological feasibility should be tested in the laboratory and in the field.

The next generation of thermal stress guidance should pay close attention to the development of alternative methods of minimizing thermal strain by the adoption of sound thermal disciplines. Although current thermal disciplines perform well for personnel that are well acclimatized, hydrated, and compliant with doctrine; future disciplines should be simpler to implement in an operational environment. Future disciplines should generate safety features which allow for the hydration and acclimation level of the personnel as well as individual differences. An important safety feature should be that the need for "surge" operations during emergency situations should not immediately place the personnel in extreme casualty risk.

The results of this effort should be carefully evaluated, then provided to the preventative medicine program and prepared as commander's guidance to support Operation Desert Shield. After systematic and rigorous validation of the methodology and the results from this study are completed, informed transition of the information to both the preventative medicine program of the U.S. Army Surgeon General's office and the doctrinal development programs of the U.S. Army Training and Doctrine Command as represented by the U.S. Army Academy of Health Science can be accomplished.

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3. Berlin, Henry M., Leander Stroschein and Ralph M. Goldman, A Computer Program to Predict Energy Cost, Rectal, Temperature, and Heart Rate Response to Work, Clothing, and Environment, Edgewood Arsenal Special Publication ED-SP-75011, Chemical Systems Laboratory, Aberdeen Proving Ground, MD, November 1975.

4. Matthew, W.T., "Heat Stress Analysis", Heat Research Division, U.S. Army Research Institute of Environmental Medicine, Natick, MA, February 1989.

5. Personal correspondence from Mr. Bill Matthew U.S. Army Research Institute of Environmental Medicine, Natick, MA, 1989.

6. Personal correspondence from Mr. Leander Stroschein, U.S. Army Research Institute of Environmental Medicine, Natick, MA, 1990.

APPENDIX A:
Methodology for Implementing Time-Dependent Predictions of Core Temperature in Goldman-Givoni Model

The methodology for implementing work/rest discipline, or the consequences of changing clothing, environmental, or workload conditions, in the Goldman-Givoni model is based on three functions. The dominant function within the Goldman-Givoni model is the equation which establishes the difference in core temperature expected at equilibrium. This fundamental function is identical with earlier versions of the Goldman-Givoni model and no changes are required to implement time dependent predictions of core temperature. The functions which describe the delay characteristics after a change in conditions occurs and which describe the rate of change of core temperature are the critical component to adapting the Goldman-Givoni model to reflect the response of core temperature.

The "delay" function and the "rate of change" function are represented in the SAIC implementation of Goldman-Givoni in four subroutines. These routines are the TRETIM, ATTIME, WORK, and RECOV subroutines. The TRETIM subroutine calculates the actual times for which core temperatures will have to be calculated.

The time for changes in environmental conditions, clothing parameters, and metabolic work loads ar input into the TIME array during the interactive phase of program execution (SUBROUTINE RACTIV). The predicted equilibrium core temperature is calculated for each distinct set of conditions is calculated in SUBROUTINE TCORE. The main program passes the calculated core temperature for each set of conditions to SUBROUTINE TRETIM in array TREF. Also passed to SUBROUTINE TRETIM are the times for the start of each set of conditions in array TIME, the change of core temperature based on acclimatization level as array DTREFA, the net metabolic rate in array M, and the wet heat coefficient in array EDIF. All arrays are indexed by a counter, EQUIL, which is incremented for each time that results in a change to environmental conditions, clothing, or work rate. SUBROUTINE TRETIM takes the discrete characteristics of the Goldman-Givoni model and simulates the dynamic, pseudo-continuous time process of changing core temperature over time.

The time domain within this routine is divided into two regions. The first region occurs during the "delay time." The delay time is a period where changes in core temperature are driven by the rate of change of core temperature at the start of the delay period and the magnitude of the change in core temperature necessary to reach equilibrium that results from a change in metabolic rate. The core temperature is calculated every minute during the delay time. The equations in use for calculating core temperature are sensitive to the calculation interval. This sensitivity is the reason behind using a fixed interval of one minute. The second region occurs between the end of the delay time and the next change in conditions. The core temperature in this region can be calculated at any arbitrary time, there is no sensitivity to calculation interval. The core

temperature is dependent on the initial core temperature (at the end of the proceeding delay time), the equilibrium core temperature from the current conditions, the time in the period (from the end of the proceeding delay time), and an exponential coefficient which represents the environmental cooling power for recovery or the difference between required and maximum evaporative heat transfer potential.

Within SUBROUTINE TRETIM, it is necessary to set the time delay. For recovery periods the time delay is based on the cooling power (set by the difference between Ereq and Emax), not to exceed 15 minutes.

```
TDELAY=MIN(15.,15.*EXP(-0.5*CPEFF))
CPEFF=0.015*EDIF(I)
```

where

TDELAY is the time delay in minutes
CPEFF is the cooling power
EDIF(I) is the difference between Ereq and Emax for the time period I

The time delay for the work conditions is based on the change in the level of energy expenditures. No time delay is generated for work at the same energy expenditure.

```
TDELAY=3480./M(1) for the initial period
or
TDELAY=3480./(105.+ABS(M(I)-M(I-1)))
or
TDELAY=0. for work at the same metabolic level
```

The logic that follows within SUBROUTINE TRETIM allows the change in core temperature, DTREF, to vary during the delay time period. A predicted core temperature, TRET, is found for each time. The times are determined in a manner which generates a time every minute during the delay time period and at a user specified interval, DELTIM, (default of 5 minutes) during the remainder of the time before the next change in conditions. While the equilibrium core temperature value remains the same, the core temperature calculated at any time, TRET, is modified during a change in metabolic rate (from changing the work load or from starting a recovery time period). (This approach was inspired by a conversation with Mr. Leander Stroschein on 27 April 1990.)

SUBROUTINE TRETIM generates the relevant time and core temperature data and calls SUBROUTINE ATTIME to calculate a value of core temperature at a given time. SUBROUTINE ATTIME quite simply calls the routine necessary to generate the next core temperature value. The recovery equations are used ONLY for resting personnel and are contained in SUBROUTINE RECOV. The

work equations apply to all working periods--with the time delay for working periods proportional to the change in work levels only and are contained in SUBROUTINE WORK.

Within SUBROUTINE RECOV, the exponential coefficient for cooling after the appropriate delay uses the absolute value of the CPEFF. The delay time equation --

$$DELAY=15*exp(-0.5*CPEFF)$$

where

$$CPEFF >= 0 \text{ and}$$

$$DELAY=15$$

where

$$CPEFF < 0$$

is based on the cooling power which was generated as discussed above in SUBROUTINE TRETIM.

The principle case with SUBROUTINE RECOV uses the value of the cooling power (CPEFF) to calculate an exponential rate coefficient, KRCY, the core temperature, TRET, at time TIME as follows:

```
KRCY=(1.-EXP(-1.5*ABS(CPEFF)))/40.
TRET=TRE0 + DTREF*(1.-EXP(-KRCY*(TIME-DELAY)))
```

The above equations are used after the delay time has been completed. TRE0 is the core temperature at the end of the delay time period.

Mr. Leander Stroschein suggested on 27 April 1990 that during the delay time, the core temperature continues to rise at 1/2 the rate per minute that it was rising during the previous time period and that the maximum core temperature that will be achieved will ultimately be used to define the delta that will be used by the recovery period. This approach was modified so that the actual core temperature would be the time-weighted average of the rate of rise with the instantaneous rate of cooling that would occur at the end of the delay period.

```
TRET=TRE0 + RISE * (DELAY-TIME)/DELAY +
    DTREF*(1.-EXP(-KRCY))*TIME/DELAY
```

This approach has the advantage in generating a smooth transition in core temperature at both the beginning and end of the delay period. Note that the 1/2 rate of change per minute is exactly matched in the case where the rate of core temperature change at the end of the delay period approaches zero.

The principle case with SUBROUTINE WORK uses the time delay equation,

$$DELAY = 3480 / M$$

uses the value of net metabolic rate when there is a change of metabolic rate and DELAY = 0 if there is no change in metabolic rate. The value of the change of core temperature (with the benefit of acclimatization eliminated,

```
DTREFC=MAX(0.,DTREF-DTREFA)
```

is used to calculate an exponential rate coefficient, KWRK, as well as the core temperature, TRET, at time TIME as follows:

```
KWRK=(1.+3.*EXP(-.3*(DTREFC)))/120.
TRET=TRE0 + DTREF*(1.-EXP(-KWRK*(TIME-DELAY)))
```

The above equations are used after the delay time has been completed. TRE0 is the core temperature at the end of the delay time period.

The approach adapted for handling core temperature predictions during a delay period initiated by a change in metabolic rates was approached in a manner analogous to the approach adopted in going for work to a recovery period. The actual core temperature would be the time-weighted average of the rate of change in core temperature of the previous period before the start of the delay period with the instantaneous rate of core temperature change that would occur at the end of the delay period as calculated based on DTREF and KWRK.

```
TRET=TRE0 + RISE * (DELAY-TIME)/DELAY +
    TIME/DELAY*DTREF*(1.-EXP(-KWRK))
```

This approach has the advantage in generating a smooth transition in core temperature at both the beginning and end of the delay period.

APPENDIX B
Goldman-Givoni Source Listing

```
 INTERFACE TO SUBROUTINE ATTIME
&                   (TRET, TRBEG, DTREF, DTREFA, DELTM,
&                    DELT, TDELAY, RISE, CPEFF, LAST,
&                    TIM, VALUE, NEWMET, REST)
 INTEGER DELT, LAST
 REAL CPEFF, DELTM, DTREF, DTREFA, RISE, TDELAY, TIM,
&     TRBEG, TRET, VALUE
 LOGICAL NEWMET, REST
 DIMENSION VALUE(2,2048)
 END
 INTERFACE TO SUBROUTINE DIGIT
&                   (MIDPT, LABEL, SCREEN, LINE, AXIS)
 INTEGER MIDPT, LABEL, LINE
 CHARACTER*1 SCREEN, AXIS
 DIMENSION SCREEN(24,80)
 END
 INTERFACE TO SUBROUTINE DISPLA
&                   (TEMPC, HUMID, WIND, METAB, WEX,
&                    CLO, IMCLO, GAMMAC, GAMMAI, SKIN, DEHYD,
&                    DIH, TIME, TREND, LIMIT)
 REAL CLO, GAMMAC, GAMMAI, HUMID, IMCLO, METAB, SKIN, TEMPC,
&     WIND, DIH, DEHYD, TIME, TREND, WEX
 LOGICAL LIMIT
 END
 INTERFACE TO FUNCTION ERFCTN(X)
 REAL ERFCTN, X
 END
 INTERFACE TO SUBROUTINE INIT
&                   (AREA, CLO, DEHYD, DIH, GAMMAC, GAMMAI,
&                    HUMID, IMCLO, METAB, WEX, PATM, SKIN,
&                    TEMPC, WIND, TREND)
 REAL AREA, CLO, DEHYD, DIH, GAMMAC, GAMMAI, HUMID, IMCLO,
&     METAB, PATM, SKIN, TEMPC, TREND, WEX, WIND
 END
 INTERFACE TO FUNCTION LASTTM
&                   (TMBEG, TRBEG, TREND, TDELAY, DTREFA, CPEFF)
 INTEGER LASTTM, TMBEG
 REAL CPEFF, DTREFA, TDELAY, TRBEG, TREND
 END
 INTERFACE TO SUBROUTINE MENU
&                   (CHOICE, DONE, RUN)
 CHARACTER*2 CHOICE
 LOGICAL DONE, RUN
 END
 INTERFACE TO SUBROUTINE NEWMET
&                   (METRAT,TREF,TREND,
&                    FIRST, TOHIGH, TOLOW)
 REAL METRAT, TREF, TREND
 LOGICAL FIRST, TOHIGH, TOLOW
 END
 INTERFACE TO SUBROUTINE PRBCAS(TRE,PROB)
 REAL PROB, TRE
 END
 INTERFACE TO SUBROUTINE PLOT
&                   (VALUE, SCREEN, TMAX, TMIN,
&                    COLMAX, COLMIN, ROWMAX, ROWMIN)
 INTEGER ROWMAX, ROWMIN, COLMAX, COLMIN
 REAL TMAX, TMIN, VALUE
 CHARACTER*1 SCREEN
 DIMENSION SCREEN(24,80), VALUE(2,2048)
 END
 INTERFACE TO SUBROUTINE RACTIV
```

```
&                    (TEMPC, HUMID, WIND, METAB, WEX,
&                     CLO, IMCLO, GAMMAC, GAMMAI, SKIN, DEHYD,
&                     DIH, TIME, TREND, EQUIL, DONE,
&                     LIMIT)
      INTEGER EQUIL
      REAL CLO, GAMMAC, GAMMAI, HUMID, IMCLO, METAB, SKIN,
     &     TEMPC, WIND, DIH, DEHYD, TIME, TREND, WEX
      LOGICAL DONE, LIMIT
C
      DIMENSION TEMPC(128), HUMID(128), WIND(128), METAB(128),
     &          WEX(128), CLO(128), IMCLO(128), GAMMAC(128),
     &          GAMMAI(128),
     &          SKIN(128), DEHYD(128), DIH(128), TIME(128)
      END
      INTERFACE TO SUBROUTINE RECOV
     &                    (TRET, TRE0, DTREF, TIME, DELAY, RISE,
     &                     DELT, CPEFF)
      INTEGER DELT
      REAL CPEFF, DELAY, DTREF, RISE,
     &     TRE0, TRET, TIME
      END
      INTERFACE TO SUBROUTINE RESULT (VALUE)
      REAL VALUE
      DIMENSION VALUE(2,2048)
      END
      INTERFACE TO SUBROUTINE SAVE
     &                    (VALUE, SCREEN, CASUAL, MAXTRE, N)
      INTEGER N
      REAL CASUAL, MAXTRE, VALUE
      CHARACTER*1 SCREEN
      DIMENSION SCREEN(24,80), VALUE(2,2048)
      END
      INTERFACE TO SUBROUTINE SCALER (TIM,SCALE)
      REAL TIM, SCALE
      END
      INTERFACE TO SUBROUTINE SET
     &                    (SCREEN,COLMIN,COLMAX,ROWMIN,ROWMAX,TMAX,TMIN)
      INTEGER COLMIN, COLMAX, ROWMIN, ROWMAX
      REAL TMAX, TMIN
      CHARACTER*1 SCREEN
      DIMENSION SCREEN(24,80)
      END
      INTERFACE TO SUBROUTINE SHOW (SCREEN)
      CHARACTER*1 SCREEN
      DIMENSION SCREEN(24,80)
      END
      INTERFACE TO SUBROUTINE TCORE
     &              (AREA, CLO, DEHYD, DIH, PATM,
     &              GAMMAC, GAMMAI, HUMID, IMCLO,
     &              METAB, WEX, SKIN, TEMPC, WIND,
     &              TREF, TAU, TLAG, PCAS, DTREFA, M,
     &              EDIF)
      REAL AREA, CLO, DEHYD, DIH, DTREFA,
     &     EDIF, GAMMAC, GAMMAI, HUMID,
     &     IMCLO, M,
     &     METAB, PATM, SKIN, TAU, PCAS, TLAG,
     &     TEMPC, TREF, WEX, WIND
      END
      INTERFACE TO SUBROUTINE TRETIM
     &                    (VALUE, TIME, TREF, DTREFA, M, EDIF,
     &                     EQUIL, LIMIT)
      INTEGER EQUIL
```

```
      REAL M, EDIF, DTREFA, TIME,
     &     TREF, VALUE
      LOGICAL LIMIT
      DIMENSION VALUE(2,2048)
      DIMENSION DTREFA(128), M(128), TIME(128), TREF(128),
     &          EDIF(128)
      END
      INTERFACE TO SUBROUTINE WORK
     &                  (TRET, TRE0, DTREF, DTREFA, TIME, DELAY,
     &                   RISE, DELT, NEWMET)
      INTEGER DELT
      REAL DTREF, DTREFA, DELAY,
     &     TRE0, TRET, TIME
      LOGICAL NEWMET
      END
      INTERFACE TO SUBROUTINE XAXIS
     &                  (SCREEN, COLMIN, COLMAX, ROWMAX, SCALE)
      INTEGER COLMAX, COLMIN, ROWMAX
      REAL SCALE
      CHARACTER*1 SCREEN
      DIMENSION SCREEN(24,80)
      END
      INTERFACE TO SUBROUTINE YAXIS
     &                  (SCREEN,ROWMIN,ROWMAX,COLMIN,TMIN,TMAX)
      INTEGER ROWMIN, ROWMAX, COLMIN
      REAL TMIN, TMAX
      CHARACTER*1 SCREEN
      DIMENSION SCREEN(24,80)
      END
C ** PROGRAM **
      PROGRAM GOLDMAN
C*************************************************************
C     THE GOLDMAN-GIVONI MODEL HAS EVOLVED OVER A NUMBER OF
C     YEARS BASED ON EMPIRICAL EQUATIONS DEVELOPED AT THE
C     U.S. ARMY RESEARCH INSTITUTE OF ENVIRONMENTAL MEDICINE
C*************************************************************
      REAL AREA, CLO, DEHYD, DIH, DTREFA, EDIF, GAMMAC, GAMMAI,
     &     HUMID, IMCLO, M, METAB, PATM, PCAS, SKIN, TAU,
     &     TEMPC, TIME, TLAG, TREF, TREND, VALUE, WEX, WIND
      INTEGER EQUIL, T
      CHARACTER PMODE*1
      LOGICAL DONE, FIRST, LIMIT, TOHIGH, TOLOW
C
      DIMENSION VALUE(2,2048)
      DIMENSION AREA(128), CLO(128), DEHYD(128), DIH(128),
     &          DTREFA(128), EDIF(128), GAMMAC(128), GAMMAI(128),
     &          HUMID(128), IMCLO(128),
     &          M(128), METAB(128), PATM(128),
     &          SKIN(128), TEMPC(128), TIME(128),
     &          TREF(128), WEX(128), WIND(128)
C
C     INITIALIZE VARIABLES TO DEFAULT VALUES
C
      EQUIL=0
      DONE=.FALSE.
      LIMIT=.FALSE.
C
      CALL INIT(AREA(1), CLO(1), DEHYD(1), DIH(1), GAMMAC(1),
     &          GAMMAI(1), HUMID(1), IMCLO(1), METAB(1),
     &          WEX(1), PATM(1), SKIN(1), TEMPC(1), WIND(1),
     &          TREND)
C
```

```
C       DISPLAY TCORE MENU OR BEGIN BATCH PROCESSING ROUTINES
C
 10   WRITE(6,FMT='(1X,A25,A39)')
     &             'RUN TCORE (I)NTERACTIVELY',
     &             ' OR TO ESTABLISH METABOLIC RATE (L)IMIT'
      READ(5,FMT='(A1)',ERR=10) PMODE
C
      IF ((PMODE .EQ. 'I') .OR. (PMODE .EQ. 'i')) THEN
        CONTINUE
      ELSE IF ((PMODE .EQ. 'L') .OR. (PMODE .EQ. 'l')) THEN
        LIMIT=.TRUE.
      ELSE
        GOTO 10
      ENDIF
C
 100  CONTINUE
      FIRST=.TRUE.
C
      CALL RACTIV(TEMPC, HUMID, WIND, METAB, WEX,
     &              CLO, IMCLO, GAMMAC, GAMMAI, SKIN, DEHYD,
     &              DIH, TIME, TREND, EQUIL, DONE,
     &              LIMIT)
C
      IF (DONE) GOTO 5000
C
C     START CALCULATIONS
C
CR
CR      WRITE(6,*) '   EQUIL',EQUIL
CR
      DO 1000 T=1,EQUIL
C
 500     CONTINUE
C
         CALL TCORE(AREA(1), CLO(T), DEHYD(T), DIH(T), PATM(1),
     &             GAMMAC(T), GAMMAI(T), HUMID(T), IMCLO(T),
     &             METAB(T), WEX(T), SKIN(T), TEMPC(T), WIND(T),
     &             TREF(T), TAU, TLAG, PCAS, DTREFA(T), M(T),
     &             EDIF(T))
C
         IF (LIMIT) THEN
           IF (ABS(TREF(T)-TREND) .LE. 0.0005) THEN
             WRITE(6,FMT='(1X,A34,A21,F6.2,A4,F6.0,A6)')
     &                  'THE METABOLIC RATE WHICH PRODUCES ',
     &                  'A FINAL CORE TEMP OF ',TREF(T),
     &                  ' IS ',METAB(T),' WATTS'
           ELSE
             CALL NEWMET(METAB(T), TREF(T), TREND,
     &                  FIRST, TOHIGH, TOLOW)
             IF (TOHIGH .OR. TOLOW) THEN
               GOTO 100
             ELSE
               GOTO 500
             ENDIF
           ENDIF
         ENDIF
C
CR
CR      WRITE(6,*) ' ',T,' TIME ',TIME(T),' THE VALUE OF TREF'
CR      WRITE(6,*) ' WAS                                ',TREF(T)
CR
 1000 CONTINUE
```

```
C
C             COMPUTE TIME DEPENDENT CORE TEMPERATURE
C
CR
CR
      CALL TRETIM (VALUE, TIME, TREF, DTREFA, M, EDIF,
     &             EQUIL, LIMIT)
C
C          GRAPHICALLY DISPLAY THE INTERACTIVE RESULTS
C                            OR
C                  GENERATE THE OUTPUT FILE
C
      CALL RESULT (VALUE)
C
      IF (.NOT. DONE) GOTO 100
C
 5000 CONTINUE
C
      STOP
      END
C ***SUBROUTINES & FUNCTIONS LISTED IN ALPHAPETICAL ORDER ***
C **A**
      SUBROUTINE ATTIME (TRET, TRBEG, DTREF, DTREFA, DELTM,
     &                   DELT, TDELAY, RISE, CPEFF, LAST,
     &                   TIM, VALUE, NEWMET, REST)
      INTEGER DELT, LAST
      REAL CPEFF, DELTM, DTREF, DTREFA, RISE, TDELAY, TIM,
     &     TRBEG, TRET, VALUE
      LOGICAL NEWMET, REST
C
      DIMENSION VALUE(2,2048)
C
C
C      Use the recovery equations ONLY for resting personnel,
C        the work equations apply to all working periods--
C        with the time delay for working periods proportional
C        to the change in work levels only.
C
C       (Conversation with Mr. Leander Stroschein on 27 April
C       1990.)
C
            IF (.NOT. REST) THEN
              CALL WORK (TRET, TRBEG, DTREF, DTREFA, DELTM, TDELAY,
     &                   RISE, DELT, NEWMET)
            ELSE
              CALL RECOV (TRET, TRBEG, DTREF, DELTM, TDELAY, RISE,
     &                    DELT, CPEFF)
            ENDIF
            LAST=LAST+1
            VALUE(1,LAST)=TIM
            VALUE(2,LAST)=TRET
C
      RETURN
      END
C **D**
      SUBROUTINE DIGIT(MIDPT, LABEL, SCREEN, LINE, AXIS)
      INTEGER MIDPT, LABEL, LINE
      CHARACTER*1 SCREEN, STRING, AXIS
C
      DIMENSION SCREEN(24,80), STRING(4)
C
      IF (LINE+1 .GT. 24 .OR. LINE+1 .LT. 1 .OR.
```

```
     &    MIDPT .GT. 80 .OR. MIDPT-3 .LT. 1) THEN
          WRITE(6,FMT='(1X,A8,I4,A15,I4,A32)')
     &              'THE ROW ',LINE,' OR THE COLUMN ',MIDPT,
     &              ' EXCEEDED THE ESTABLISHED LIMITS'
          WRITE(6,FMT='(1X)')
          RETURN
        ENDIF
C
        IF (AXIS .EQ. 'X') THEN
          IF (LABEL .LT. 10) THEN
            SCREEN(LINE+1,MIDPT)=CHAR(LABEL+48)
          ELSE IF (LABEL .LT. 100) THEN
            SCREEN(LINE+1,MIDPT-1)=CHAR(LABEL/10+48)
            SCREEN(LINE+1,MIDPT)=CHAR(MOD(LABEL,10)+48)
          ELSE IF (LABEL .LT. 1000 .AND. MIDPT .LT. 79) THEN
            SCREEN(LINE+1,MIDPT-1)=CHAR(LABEL/100+48)
            SCREEN(LINE+1,MIDPT)=CHAR(MOD(LABEL,100)/10+48)
            SCREEN(LINE+1,MIDPT+1)=CHAR(MOD(LABEL,10)+48)
          ELSE IF (LABEL .LT. 1000 .AND. MIDPT .EQ. 79) THEN
            SCREEN(LINE+1,MIDPT-2)=CHAR(LABEL/100+48)
            SCREEN(LINE+1,MIDPT-1)=CHAR(MOD(LABEL,100)/10+48)
            SCREEN(LINE+1,MIDPT)=CHAR(MOD(LABEL,10)+48)
          ELSE IF (LABEL .LT. 10000 .AND. MIDPT .LT. 79) THEN
            SCREEN(LINE+1,MIDPT-2)=CHAR(LABEL/1000+48)
            SCREEN(LINE+1,MIDPT-1)=CHAR(MOD(LABEL,1000)/100+48)
            SCREEN(LINE+1,MIDPT)=CHAR(MOD(LABEL,100)/10+48)
            SCREEN(LINE+1,MIDPT+1)=CHAR(MOD(LABEL,10)+48)
          ELSE IF (LABEL .LT. 10000 .AND. MIDPT .EQ. 79) THEN
            SCREEN(LINE+1,MIDPT-3)=CHAR(LABEL/1000+48)
            SCREEN(LINE+1,MIDPT-2)=CHAR(MOD(LABEL,1000)/100+48)
            SCREEN(LINE+1,MIDPT-1)=CHAR(MOD(LABEL,100)/10+48)
            SCREEN(LINE+1,MIDPT)=CHAR(MOD(LABEL,10)+48)
          ENDIF
        ELSE IF (AXIS .EQ. 'Y') THEN
          IF (LABEL .LT. 10) THEN
            SCREEN(LINE,MIDPT-2)=CHAR(LABEL+48)
          ELSE IF (LABEL .LT. 100) THEN
            SCREEN(LINE,MIDPT-3)=CHAR(LABEL/10+48)
            SCREEN(LINE,MIDPT-2)=CHAR(MOD(LABEL,10)+48)
          ENDIF
        ENDIF
C
        RETURN
        END
C ** D **
        SUBROUTINE DISPLA(TEMPC, HUMID, WIND, METAB, WEX,
     &                    CLO, IMCLO, GAMMAC, GAMMAI, SKIN, DEHYD,
     &                    DIH, TIME, TREND, LIMIT)
        REAL CLO, GAMMAC, GAMMAI, HUMID, IMCLO, METAB, SKIN, TEMPC,
     &       WIND, DIH, DEHYD, TIME, TREND, WEX
        LOGICAL LIMIT
C
        WRITE(6,FMT='(15X,A7,2X,I5,2X,A7)')
     &              'AT TIME',INT(TIME),'minutes'
        WRITE(6,FMT='(1X,A50)')
     &       '**************************************************'
        WRITE(6,FMT='(1X, A34, F6.1, A11)')
     &              ' 1  Temperature                    ',TEMPC,
     &              ' degrees C '
        WRITE(6,FMT='(1X, A34, F6.1, A2)')
     &              ' 2  Relative Humidity              ',HUMID,' %'
        WRITE(6,FMT='(1X, A34, F6.1, A6)')
```

```
     &          ' 3  Wind Speed                          ',WIND,' m/sec'
      WRITE(6,FMT='(1X, A34, F6.0, A6)')
     &         ' 4  Metabolic Work Rate                ',METAB,' Watts'
      WRITE(6,FMT='(1X, A34, F6.0, A6)')
     &          ' 5  External Work Completed            ',WEX,' Watts'
      WRITE(6,FMT='(1X, A34, F6.2, A5)')
     &          ' 6  Clothing Insulation                ',CLO,' Clo '
      WRITE(6,FMT='(1X, A34, F6.2)')
     &          ' 7  Im/Clo effective permeability ',IMCLO
      WRITE(6,FMT='(1X, A34, F6.2)')
     &          ' 8  Gamma wind correction (CLO)    ',GAMMAC
      WRITE(6,FMT='(1X, A34, F6.2)')
     &          ' 9  Gamma wind correction (Im/CLO)',GAMMAI
      WRITE(6,FMT='(1X, A34, F6.1, A11)')
     &          ' 10 Skin Temperature                ',SKIN,
     &          ' degrees C'
      WRITE(6,FMT='(1X,A34,F6.1)')
     &          ' 11 Days in Heat                    ',DIH
      WRITE(6,FMT='(1X,A34,F6.1,A2)')
     &          ' 12 Dehydration                     ',DEHYD,' %'
      IF (LIMIT)
     &WRITE(6,FMT='(1X,A34,F6.2,A3)')
     &          ' 20 Core Temperature Limit          ',TREND,' oC'
      WRITE(6,FMT='(1X,A50)')
     &     '**************************************************'
      WRITE(6,FMT='(1X)')
C
      RETURN
      END
C **E**
      FUNCTION ERFCTN(X)
C*****************************************************************
C       Computes the value of the error function at the point X
C       Ref: C. Hastings, Approximations for Digital Computers,
C        Princeton Univ. Press, Princeton, NJ, 1955
C       Referenced by: CALC
C       External References: None
C*****************************************************************
      REAL A1, A2, A3, A4, A5, A6, ERFCTN, PI, SIGN, X, X2, X3,
     &     X4, X5, X6, XMAX, XMIN, Y
C
      PARAMETER (A1=0.0705230784, A2=0.0422820123, A3=0.0092705272,
     &           A4=0.0001520143, A5=0.0002765672, A6=0.0000430638,

     &           PI=3.14159265, XMIN=1.E-5, XMAX=5.)
C
C     X IS EQUAL TO THE Z-SCORE OF A CUMULATIVE NORMAL DISTRIBUTION
C     * 1/ SQRT(2)      (X = Z * 1/SQRT(2))
C
      IF (X .EQ. 0.) THEN
         ERFCTN=0.0
         GO TO 999
      END IF
C
      SIGN=X/ABS(X)
      X=ABS(X)
C
      IF (X .LT. XMIN) THEN
        ERFCTN=2.*X/SQRT(PI)
      ELSE IF (X .GT. XMAX) THEN
        ERFCTN=1.0
      ELSE
```

```
        X2=X*X
        X3=X2*X
        X4=X3*X
        X5=X4*X
        X6=X5*X
C
        Y=1.+A1*X
        Y=Y+A2*X2
        Y=Y+A3*X3
        Y=Y+A4*X4
        Y=Y+A5*X5
        Y=Y+A6*X6
C
        Y=Y**16
        Y=1./Y
C
        ERFCTN=1.-Y
      END IF
C
      X=SIGN*X
      ERFCTN=SIGN*ERFCTN
C
C     TO GENERATE PROBABILITY ON CUMULATIVE NORMAL DISTRIBUTION
C     RETURN ERF/2 + 0.5
C
      ERFCTN = ERFCTN/2.0 + 0.5
      ERFCTN = ERFCTN * 100.0
C
  999 RETURN
      END
C **I**
      SUBROUTINE INIT(AREA, CLO, DEHYD, DIH, GAMMAC, GAMMAI,
     &                HUMID, IMCLO, METAB, WEX, PATM, SKIN,
     &                TEMPC, WIND, TREND)
C*****************************************************************
C     Subroutine init initializes the variables used by
C     TCORE to their appropriate defaults
C     Referenced by:  Main program
C     External References: None
C*****************************************************************
      REAL AREA, CLO, DEHYD, DIH, GAMMAC, GAMMAI, HUMID, IMCLO,
     &     METAB, PATM, SKIN, TEMPC, TREND, WEX, WIND
C
C     SET DEFAULTS FOR TCORE VARIABLES
C
      SKIN = 36.5
      AREA = 1.8
      WIND = 3.
      GAMMAC = 0.26
      GAMMAI = 0.38
      TEMPC=20
      METAB=425.
      WEX=0.
      HUMID=20
      CLO=1.13
      IMCLO=.43
      PATM=760.
      DIH = 12.
      DEHYD = 0.
      TREND = 38.5
C
      RETURN
```

```
      END
C ** I **
      SUBROUTINE INPUT(TEMPC, HUMID, WIND, METAB, WEX,
     &                 CLO, IMCLO, GAMMAC, GAMMAI, SKIN, DEHYD,
     &                 DIH, TREND, CHOICE, LIMIT)
      REAL CLO, ENTRY, GAMMAC, GAMMAI, HUMID, IMCLO, METAB, SKIN,
     &     TEMPC,
     &     WIND, DIH, DEHYD, TREND, WEX
      CHARACTER*2 CHOICE
      LOGICAL LIMIT
C
      IF (CHOICE .EQ. 'T' .OR. CHOICE .EQ. 't' .OR.
     &    CHOICE .EQ. '1 ') THEN
 21     WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A41,A11)')
     &               ' Enter the Ambient Temperature in degrees',
     &               ' Centigrade'
        READ(5,*,ERR=21) ENTRY
        IF (ENTRY .GE. -50. .AND. ENTRY .LE. 50.) THEN
          TEMPC=ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &                ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 21
        ENDIF
      ELSE IF (CHOICE .EQ. 'H' .OR. CHOICE .EQ. 'h' .OR.
     &         CHOICE .EQ. '2') THEN
 22     WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A36)')
     &               ' Enter the percent Relative Humidity'
        READ(5,*,ERR=22) ENTRY
        IF (ENTRY .GE. 0. .AND. ENTRY .LE. 100.) THEN
          HUMID=ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &                ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 22
        ENDIF
      ELSE IF (CHOICE .EQ. 'W' .OR. CHOICE .EQ. 'w' .OR.
     &         CHOICE .EQ. '3') THEN
 23     WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A38)')
     &               ' Enter the Wind Speed in meters/second'
        READ(5,*,ERR=23) ENTRY
        IF (ENTRY .GE. 0. .AND. ENTRY .LE. 10.) THEN
          IF (ENTRY .LT. .5) THEN
            ENTRY=0.5
            WRITE(6,FMT='(1X,A38)')
     &                  ' A NOMINAL WIND SPEED OF .5 M/SEC USED'
            WRITE(6,FMT='(1X)')
          ENDIF
          WIND=ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &                ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 23
        ENDIF
      ELSE IF (CHOICE .EQ. 'M' .OR. CHOICE .EQ. 'm' .OR.
     &         CHOICE .EQ. '4') THEN
```

```
24      WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A34)')
     &              ' Enter the Metabolic Rate in Watts'
        READ(5,*,ERR=24) ENTRY
        IF (ENTRY .GE. 0. .AND. ENTRY .LE. 800) THEN
          IF (ENTRY .LT. 105.) THEN
            ENTRY=105.
            WRITE(6,FMT='(1X,A43)')
     &         ' A NOMINAL METABOLIC RATE OF 105 WATTS USED'
          ENDIF
          METAB=ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &           ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 24
        ENDIF
      ELSE IF (CHOICE .EQ. 'WE' .OR. CHOICE .EQ. 'we' .OR.
     &         CHOICE .EQ. 'We' .OR. CHOICE .EQ. '5') THEN
25      WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A38)')
     &              ' Enter the External Work Rate in Watts'
        READ(5,*,ERR=25) ENTRY
        IF (ENTRY .GE. 0. .AND. ENTRY .LE. 800) THEN
          WEX=ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &           ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 25
        ENDIF
      ELSE IF (CHOICE .EQ. 'C' .OR. CHOICE .EQ. 'c' .OR.
     &         CHOICE .EQ. '6') THEN
26      WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A43)')
     &              ' Enter the Clothing Insulation Value in Clo'
        READ(5,*,ERR=26) ENTRY
        IF (ENTRY .GE. .65 .AND. ENTRY .LE. 5.) THEN
          CLO=ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &              ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 26
        ENDIF
      ELSE IF (CHOICE .EQ. 'I' .OR. CHOICE .EQ. 'i' .OR.
     &    CHOICE .EQ. '7') THEN
27      WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A46,A15)')
     &       ' Enter the effective permiability coefficient',
     &              'known as Im/Clo'
        READ(5,*,ERR=27) ENTRY
        IF (ENTRY .GE. .0 .AND. ENTRY .LE. 1.) THEN
          IMCLO=ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &           ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 27
        ENDIF
      ELSE IF (CHOICE .EQ. 'G' .OR. CHOICE .EQ. 'g' .OR.
     &         CHOICE .EQ. '8') THEN
```

```
28      WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A46,A25)')
     &         ' Enter the wind speed corrrection coefficient',
     &              'GAMMA for CLO '
        READ(5,*,ERR=28) ENTRY
        IF (ENTRY .GE. .15 .AND. ENTRY .LE. .5) THEN
          GAMMAC=ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &             ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 28
        ENDIF
      ELSE IF (CHOICE .EQ. 'G' .OR. CHOICE .EQ. 'g' .OR.
     &         CHOICE .EQ. '9') THEN
29      WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A46,A25)')
     &         ' Enter the wind speed corrrection coefficient',
     &              'GAMMA Im/CLO'
        READ(5,*,ERR=29) ENTRY
        IF (ENTRY .GE. .15 .AND. ENTRY .LE. .5) THEN
          GAMMAI=ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &             ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 29
        ENDIF
      ELSE IF (CHOICE .EQ. 'S' .OR. CHOICE .EQ. 's' .OR.
     &    CHOICE .EQ. '10') THEN
30      WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A49)')
     &     ' Enter the skin temperature in degrees Centigrade'
        READ(5,*,ERR=30) ENTRY
        IF (ENTRY .GE. 0. .AND. ENTRY .LE. 40.) THEN
          SKIN=ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &             ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 30
        ENDIF
      ELSE IF (CHOICE .EQ. 'DA' .OR. CHOICE .EQ. 'da' .OR.
     &    CHOICE .EQ. 'Da' .OR. CHOICE .EQ. '11') THEN
31      WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A29)')
     &              ' Enter number of days in heat'
        READ(5,*,ERR=31) ENTRY
        IF (ENTRY .GE. 0.) THEN
          DIH = ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &             ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 31
        ENDIF
      ELSE IF (CHOICE .EQ. 'DE' .OR. CHOICE .EQ. 'de' .OR.
     &    CHOICE .EQ. 'De' .OR. CHOICE .EQ. '12') THEN
32      WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A27)')
     &              ' Enter level of dehydration'
        READ(5,*,ERR=32) ENTRY
```

```
        IF (ENTRY .GE. 0.) THEN
          DEHYD = ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &             ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 32
        ENDIF
       ELSE IF (LIMIT .AND. (CHOICE .EQ. 'L') .OR.
     &    CHOICE .EQ. '1' .OR. CHOICE .EQ. '20') THEN
 40      WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A43)')
     &              ' Enter desired equilibrium core temperature'
        READ(5,*,ERR=40) ENTRY
        IF (ENTRY .GE. 36. .AND. ENTRY .LE. 42) THEN
          TREND = ENTRY
          RETURN
        ELSE
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &             ' THE ENTRY ',ENTRY,' IS OUT OF RANGE'
          GOTO 40
        ENDIF
       ELSE
        WRITE(6,FMT='(1X,A12,A1,A19)')
     &         ' THE ENTRY :',CHOICE,': IS NOT ACCEPTABLE'
        WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A17)')
     &              ' PLEASE TRY AGAIN'
       ENDIF
C
       RETURN
       END
C **L**
      FUNCTION LASTTM (TMBEG, TRBEG, TREND, TDELAY, DTREFA, CPEFF)
      INTEGER LASTTM, TMBEG
      REAL CPEFF, DTREF, DTREFA, K, TDELAY, TRBEG, TREND
C
      DTREF=TREND-TRBEG
C
C  Coefficient K is extracted from the work and recovery
C    subroutines called by TRETIM
C
      IF (DTREF .GT. 0.) THEN
        K=(1.+3.*EXP(-.3*(DTREF-DTREFA)))/120.
      ELSE IF (DTREF .LT. 0.) THEN
        K=(1.-EXP(-1.5*ABS(CPEFF)))/40.
      ELSE
        K=1.
      ENDIF
      IF (K .LT. .005) K=.005
C
C  This formulation is the solution of the time dependent
C    equations in WORK and RECOV subroutines
C    and THE approximate solution that EXP(-ARG)=0
C          WHEN ARG <=23.03
C
C   As an expedient, assume that the time to reach essential
C     equilibrium is no more than 240 minutes, therefore fix
C     the smallest allowed value of K to that level.
      LASTTM=TMBEG+NINT(TDELAY+MIN(240.,23.03/K))
C
CR
```

```
CR      WRITE(6,*) ' THE EQUILIBRIUM TIME WAS ',LASTTM
CR      WRITE(6,*)       ' FOR STARTING TRE OF ',TRBEG
CR      WRITE(6,*)         ' AND ENDING TRE OF ',TREND
CR      WRITE(6,*) ' FOR CONDITIONS STARTED AT ',TMBEG
CR
        RETURN
        END
C **M**
        SUBROUTINE MENU (CHOICE, DONE, RUN)
        CHARACTER*2 CHOICE
        LOGICAL DONE, LIMIT, RUN
C
 100    CONTINUE
          CHOICE = '  '
        WRITE(6,FMT='(1X,A34)')
       &             ' 99 Change the time to a new value'
        WRITE(6,FMT='(1X,A37)')
       &             ' 0  Execute TCORE with current values'
        WRITE(6,FMT='(1X,A14)')
       &             ' E  Exit TCORE'
        WRITE(6,FMT='(1X,A28)')
       &             ' SELECT A NUMBER TO CONTINUE'
        READ(5,'(A2)',ERR=100) CHOICE
C
        IF (CHOICE .EQ. 'E' .OR. CHOICE .EQ. 'e') THEN
          DONE=.TRUE.
        ELSE IF (CHOICE .EQ. '0') THEN
          RUN=.TRUE.
        ENDIF
C
        RETURN
        END
C **N**
        SUBROUTINE NEWMET (METRAT,TREF,TREND,
       &                   FIRST, TOHIGH, TOLOW)
        REAL HIMET, LOMET, METRAT, TREF, TREND
        LOGICAL FIRST, TOHIGH, TOLOW
C
        TOLOW=.FALSE.
        TOHIGH=.FALSE.
        IF (FIRST) THEN
          HIMET=1000.
          LOMET=50.
          FIRST=.FALSE.
        ENDIF
C
        IF (METRAT .LT. LOMET .OR. METRAT .GT. HIMET) THEN
          STOP 'NEWMET HAS AN ERROR'
        ENDIF
C
        IF (TREF .GT. TREND) THEN
          HIMET=MIN(METRAT,HIMET)
          METRAT=(METRAT+LOMET)/2.
          IF (METRAT-LOMET .LT. .01) THEN
            TOLOW=.TRUE.
            WRITE(6,FMT='(1X,A30,1X,A27,2X, F4.0,A5)')
       &                'These conditions would require',
       &                'a metabolic rate lower than',LOMET,
       &                'Watts'
          ENDIF
        ELSE IF (TREF .LT. TREND) THEN
          LOMET=MAX(METRAT,LOMET)
```

```
        METRAT=(METRAT+HIMET)/2.
        IF (HIMET-METRAT .LT. .01) THEN
          TOHIGH=.TRUE.
          WRITE(6,FMT='(1X,A30,1X,A28,2X,F6.0,A5)')
     &                'These conditions would require',
     &                'a metabolic rate higher than',HIMET,
     &                'Watts'
        ENDIF
       ELSE
        WRITE(6,FMT='(1X,A23)') 'ERROR IN NEWMET ROUTINE'
       ENDIF
C
       RETURN
       END
C **P**
       SUBROUTINE PRBCAS(TRE,PROB)
       REAL ERFCTN, MEAN, MODZ, PROBAB, STDDEV, SQRT2, TRE
C
C    PROBABILITY OF CASUALTY IS APPROXIMATED AS A CUMULATIVE
C    NORMAL DISTRIBUTION WITH THE MEAN EQUAL TO 39.5 AND THE
C    STD. DEV. EQUAL TO .5198
C          (THE BEST FIT TO THE NIOSH AND PANDOFF DATA)
C
       SQRT2=SQRT(2.)
       MEAN = 39.5
       STDDEV = .5198
C
       MODZ = (TRE-MEAN)/STDDEV * 1/SQRT2
C
       PROB = ERFCTN(MODZ)
       PROB = AMAX1(PROB,0.)
       PROB = AMIN1(PROB,100.)
C
       RETURN
       END
C ** P **
       SUBROUTINE PLOT (VALUE, SCREEN, TMAX, TMIN,
     &                  COLMAX, COLMIN, ROWMAX, ROWMIN)
       INTEGER COUNT, I, MAXT, ROWMAX, ROWMIN, COLMAX, COLMIN,
     &         X, Y
       REAL TIM, TMAX, TMIN, VALUE, XSCALE, YSCALE, SCALE
       CHARACTER*1 SCREEN, HIT, MISS
       LOGICAL WRONG
C
       DIMENSION SCREEN(24,80), VALUE(2,2048)
C
       HIT='O'
       MISS='*'
       TIM=0.
       COUNT=0
C
       DO 10 I=1,1024
         IF (I .EQ. 1 .OR.
     &      (I .GT. 1 .AND. VALUE(2,I) .GT. 0.)) THEN
           TIM=MAX(VALUE(1,I),TIM)
           COUNT=COUNT+1
         ENDIF
 10    CONTINUE
CR
CR     WRITE(6,*) ' THE VALUE OF COUNT IS ',COUNT
CR     WRITE(6,*) ' AND THE TIME IS ',TIM
CR
```

```
C
      CALL SCALER (TIM, SCALE)
CR
CR    WRITE(6,*) ' THE SCALE FOR THE X AXIS IS ',SCALE
CR
C
      XSCALE=FLOAT(COLMAX-COLMIN)/SCALE
      CALL XAXIS (SCREEN, COLMIN, COLMAX, ROWMAX, SCALE)
      YSCALE=REAL(ROWMAX-ROWMIN)/REAL(NINT(TMAX)-INT(TMIN))
CR
CR    WRITE(6,*) ' THE VALUE OF XSCALE & YSCALE IS ',
CR   &            XSCALE,'  ',YSCALE
C
      DO 20 I=1,COUNT
        WRONG=.FALSE.
        X=COLMIN+NINT(XSCALE*VALUE(1,I))
        Y=ROWMAX-NINT(YSCALE*(VALUE(2,I)-TMIN))
C
        IF (X .LT. COLMIN .OR. X .GT. COLMAX) THEN
CR        WRITE(6,FMT='(1X,A15,I2,A18,I2,A1,I2,A2)')
CR     &              'THE X VALUE OF ',X,'IS OUT OF RANGE [',
CR     &               COLMIN,',',COLMAX,'] '
          WRONG=.TRUE.
        ENDIF
C
        IF (Y .LT. ROWMIN .OR. Y .GT. ROWMAX) THEN
CR          WRITE(6,FMT='(1X,A15,I2,A18,I2,A1,I2,A2)')
CR     &                'THE Y VALUE OF ',Y,' IS OUT OF RANGE [',
CR     &                 ROWMIN,',',ROWMAX,'] '
          WRONG=.TRUE.
        ENDIF
C
        IF (.NOT. WRONG) THEN
          SCREEN(Y,X) = HIT
        ELSE IF (WRONG .AND.
     &           X .GE. COLMIN .AND. X .LE. COLMAX) THEN
          IF (Y .LT. ROWMIN) THEN
            SCREEN(ROWMIN,X)=MISS
          ELSE IF (Y .GT. ROWMAX) THEN
            SCREEN(ROWMAX,X)=MISS
          ENDIF
        ELSE IF (WRONG .AND.
     &           Y .GE. ROWMIN .AND. Y .LE. ROWMAX) THEN
          IF (X .LT. COLMIN) THEN
            SCREEN(Y,COLMIN)=MISS
          ELSE IF (X .GT. COLMAX) THEN
            SCREEN(Y,COLMAX)=MISS
          ENDIF
        ELSE IF (X .LT. COLMIN .AND. Y .LT. ROWMIN) THEN
          SCREEN(ROWMIN,COLMIN)=MISS
        ELSE IF (X .LT. COLMIN .AND. Y .GT. ROWMAX) THEN
          SCREEN(ROWMAX,COLMIN)=MISS
        ELSE IF (X .GT. COLMAX .AND. Y .LT. ROWMIN) THEN
          SCREEN(ROWMIN,COLMAX)=MISS
        ELSE IF (X .GT. COLMAX .AND. Y .GT. ROWMAX) THEN
          SCREEN(ROWMAX,COLMAX)=MISS
        ENDIF
CR
CR      WRITE(6,*) ' FOR TIME=',VALUE(1,I),' THE TEMP=',VALUE(2,I)
CR      WRITE(6,*) ' FOR ROW ',Y,'     AND COLUMN ',X
CR      WRITE(6,*) ' THE VALUE IS :',SCREEN(Y,X),':'
CR
```

```
 20   CONTINUE
C
      RETURN
      END
C **R**
      SUBROUTINE RACTIV (TEMPC, HUMID, WIND, METAB, WEX,
     &                   CLO, IMCLO, GAMMAC, GAMMAI, SKIN, DEHYD,
     &                   DIH, TIME, TREND, EQUIL, DONE,
     &                   LIMIT)
C*****************************************************************
C     Subroutine inteRACTIVe queries the user, in menu style,
C     as to whether the user wishes to 1) change input variables,
C     2) run TCORE (calculate Equilibrium Core Temperature and
C     PRBCAS) or 3) exit TCORE
C     Referenced by:  Main Program
C     External Reference:  None
C*****************************************************************
      INTEGER EQUIL, T
      REAL CLO, ENTRY, GAMMAC, GAMMAI, HUMID, IMCLO, METAB, SKIN,
     &     TEMPC, WIND, DIH, DEHYD, TIME, TREND, WEX
      CHARACTER*2 CHOICE
      LOGICAL DONE, LIMIT, RUN
C
      DIMENSION TEMPC(128), HUMID(128), WIND(128), METAB(128),
     &          WEX(128), CLO(128), IMCLO(128), GAMMAC(128),
     &          GAMMAI(128),
     &          SKIN(128), DEHYD(128), DIH(128), TIME(128)
C
C
C
      T=1
      EQUIL=T
C
 100  CALL DISPLA (TEMPC(T),HUMID(T), WIND(T), METAB(T), WEX(T),
     &             CLO(T), IMCLO(T), GAMMAC(T), GAMMAI(T), SKIN(T),
     &             DEHYD(T),
     &             DIH(T), TIME(T), TREND, LIMIT)
C
      RUN=.FALSE.
C
 200  CALL MENU (CHOICE, DONE, RUN)
C
      IF (DONE .OR. RUN) THEN
        RETURN
      ELSE IF (CHOICE .EQ. '99' .OR. CHOICE .EQ. 'TI' .OR.
     &         CHOICE .EQ. 'Ti' .OR. CHOICE .EQ. 'ti') THEN
        IF (LIMIT) THEN
          WRITE(6,FMT='(1X,A30,A30)')
     &                'TIME CHANGES NOT ALLOWED WHEN ',
     &                'SELECTING METABOLIC RATE LIMIT'
          GOTO 100
        ENDIF
        T=T+1
C
 300    WRITE(6,FMT='(1X)')
        WRITE(6,FMT='(1X,A46)')
     &     ' Enter the beginning time for these conditions'
        READ(5,*,ERR=300) TIME(T)
        IF (TIME(T) .LT. TIME(T-1) .OR. TIME(T) .GT. 1440.) THEN
          WRITE(6,FMT='(1X,A11,F6.3,A16)')
     &                ' THE ENTRY ',TIME(T),' IS OUT OF RANGE'
          WRITE(6,FMT='(1X,A12,1X,I6,2X,A13,A6)')
```

```
     &                'IT MUST BE >',TIME(T-1),'AND LESS THAN',
     &                ' 1 DAY'
          TIME(T)=0.
          GOTO 300
        ENDIF
        WRITE(6,FMT='(1X)')
C
        IF (T .GT. 126) THEN
          WRITE(6,FMT='(1X,A29)') 'TOO MANY TIMES TO ADD ANOTHER'
          WRITE(6,FMT='(1X,A16)') 'PLEASE TRY AGAIN'
          GOTO 200
        ENDIF
C
        TEMPC(T)=TEMPC(T-1)
        HUMID(T)=HUMID(T-1)
        WIND(T)=WIND(T-1)
        METAB(T)=METAB(T-1)
        WEX(T)=WEX(T-1)
        CLO(T)=CLO(T-1)
        IMCLO(T)=IMCLO(T-1)
        GAMMAC(T)=GAMMAC(T-1)
        GAMMAI(T)=GAMMAI(T-1)
        SKIN(T)=SKIN(T-1)
        DEHYD(T)=DEHYD(T-1)
        DIH(T)=DIH(T-1)
        EQUIL=T
        GOTO 100
      ENDIF
C
 500  CALL INPUT (TEMPC(T),HUMID(T), WIND(T), METAB(T), WEX(T),
     &            CLO(T), IMCLO(T), GAMMAC(T), GAMMAI(T), SKIN(T),
     &            DEHYD(T),
     &            DIH(T), TREND, CHOICE, LIMIT)
C
      GOTO 100
C
      RETURN
      END
C ** R **
      SUBROUTINE RECOV (TRET, TRE0, DTREF, TIME, DELAY, RISE,
     &                  DELT, CPEFF)
      INTEGER DELT
      REAL CPEFF, DELAY, DTREF, KRCY, OLDTRE, RISE,
     &     TRE0, TRET, TIME
C
C   The exponential coefficient for cooling after the appropriate
C      delay uses the absolute value of the CPEFF.  The delay time
C      equation -- DELAY=15*exp(-0.5*CPEFF) where
C                  CPEFF >= 0 and
C                  DELAY=15 where
C                  CPEFF < 0
C
C   Further note that during the delay time, the core temperature
C     continues to rise at 1/2 the rate per minute that it was
C     rising during the previous time period and that the maximum
C     core temperature that will be achieved will ultimately be
C     used to define the delta that will be used by the recovery
C     period.
C
C       (Conversation with Mr. Leander Stroschein on 27 April
C       1990.)
C
```

```
      OLDTRE=TRET
      KRCY=(1.-EXP(-1.5*ABS(CPEFF)))/40.
CR
      IF (CPEFF .LT. 0.) WRITE(6,FMT='(1X,A19,F6.2,A19)')
     &     'THE VALUE OF CPEFF ',CPEFF,' WAS LESS THAN ZERO'
CR
C
      IF (TIME .GT. DELAY .OR. DELAY .EQ. 0) THEN
        TRET=TRE0 + DTREF*(1.-EXP(-KRCY*(TIME-DELAY)))
        IF (DELT .GT. 0) RISE=(TRET-OLDTRE)/REAL(DELT)
      ELSE
        TRET=TRE0 + RISE * (DELAY-TIME)/DELAY +
     &       DTREF*(1.-EXP(-KRCY))*TIME/DELAY
      ENDIF
CR
CR      WRITE(6,*) ' FOR RESTING TIME=',TIME
CR      WRITE(6,*) ' THE STARTING CORE TEMPERATURE OF   ',TRE0
CR    WRITE(6,*) ' AND THE ENDING CORE TEMPERATURE OF ',TRE0+DTREF
CR      WRITE(6,*) ' RESULTED IN A TEMPERATURE OF       ',TRET
CR
C
C
      RETURN
      END
C ** R **
      SUBROUTINE RESULT (VALUE)
C
      INTEGER I, ROWMIN, ROWMAX, COLMIN, COLMAX, MAXT, N
      REAL TMAX, TMIN, VALUE, MAXTRE, CASUAL
      CHARACTER*1 ANS, SCREEN, POINT, HIT, MISS
C
      PARAMETER (ROWMIN=1,ROWMAX=21,COLMIN=4,COLMAX=79,
     &           TMAX=41.,TMIN=37.)
C
      DIMENSION SCREEN(24,80), VALUE(2,2048)
C
      MAXTRE=0.
C
 1    CALL SET (SCREEN,COLMIN,COLMAX,ROWMIN,ROWMAX,TMAX,TMIN)
C
       DO 100 N=1,2048
 2      CONTINUE
CR        WRITE(6,FMT='(1X,I4,1X,A29)')
CR     &             N-1,'DATA POINTS IN THE INPUT FILE'
CR        WRITE(6,FMT='(1X)')
CR        WRITE(6,FMT='(1X,A32,A40)')
CR     &             'ENTER THE VALUES YOU WOULD LIKE ',
CR     &             'TO DISPLAY (TIME,TEMP) [999,999] TO PLOT'
CR        READ(5,*,ERR=2) VALUE(1,N),VALUE(2,N)
CR        WRITE(6,FMT='(1X)')
C
CR
CR      WRITE(6,*) ' PROCESSING VALUE ',N
CR      WRITE(6,*) '              TIME ',VALUE(1,N)
CR      WRITE(6,*) '              TRET ',VALUE(2,N)
CR
        IF (ABS(VALUE(1,N)-999.) .LT. 1. .AND.
     &      ABS(VALUE(2,N)-999.) .LT. 1.) THEN
          DO 5 I=N,2048
            VALUE(1,N)=0.
            VALUE(2,N)=0.
 5        CONTINUE
```

```
C
 10       CALL PLOT (VALUE, SCREEN, TMAX, TMIN,
     &                 COLMAX, COLMIN, ROWMAX, ROWMIN)
          CALL SHOW(SCREEN)
          CALL PRBCAS(MAXTRE,CASUAL)
C
 19       WRITE(6,FMT='(1X,A37)')
     &                'DO YOU WANT TO SAVE THIS GRAPH (Y/N)?'
          READ(5,FMT='(A1)',ERR=19) ANS
          WRITE(6,FMT='(1X)')
C
          IF (ANS .EQ. 'Y' .OR. ANS .EQ. 'y')
     &       CALL SAVE(VALUE, SCREEN, CASUAL, MAXTRE, N)
C
 20       WRITE(6,FMT='(1X,A13,2X,F6.2,A28,F6.2,A2,6X,A15)')
     &                'CASUALTIES = ',CASUAL,
     &                '%  THE HIGHEST CORE TEMP OF ',MAXTRE,
     &                'oC','FINISHED (Y/N)?'
C
          READ(5,'(A1)',ERR=20) ANS
C
          IF (ANS .EQ. 'Y' .OR. ANS .EQ. 'y') THEN
            STOP
          ELSE IF (ANS .EQ. 'N' .OR. ANS .EQ. 'n') THEN
            WRITE(6,FMT='(1X,A31)')
     &                  'DO YOU WANT TO REDISPLAY (Y/N)?'
            READ(5,'(A1)',ERR=20) ANS
            IF (ANS .EQ. 'Y' .OR. ANS .EQ. 'y') THEN
              GOTO 10
            ELSE
              RETURN
            ENDIF
          ELSE
            GOTO 20
          ENDIF
        ENDIF
C
        IF (VALUE(1,N) .LT. 0. .OR.
     &      VALUE(2,N) .LT. 35. .OR. VALUE(2,N) .GT. 45.) THEN
          WRITE(6,FMT='(1X,A22,I4,A14,I4,A5,A32,A10)')
     &                ' THE VALUE ENTERED OF ',INT(VALUE(2,N)),
     &                ' AT A TIME OF ',INT(VALUE(1,N)),' min ',
     &                ' IS NOT A VALID CORE TEMPERATURE',
     &                ' (OR TIME)'
        ENDIF
       MAXTRE=MAX(MAXTRE,VALUE(2,N))
C
 100   CONTINUE
C
       RETURN
       END
C **S**
       SUBROUTINE SAVE (VALUE, SCREEN, CASUAL, MAXTRE, N)
       INTEGER I, IT, J, N
       REAL CASUAL, MAXTRE, VALUE
       CHARACTER*1 ANS, SCREEN
       CHARACTER*12 FILENAME
       CHARACTER*79 LABEL
C
       DIMENSION SCREEN(24,80), VALUE(2,2048)
C
C
```

```
C  This subroutine gets a filename and a label to be placed
C     in an output file which contains the graphic output,
C     the level of casualties and the maximum core temperature,
C     and the value of core temperature at every time during
C     model execution.
C
 10   WRITE(6,FMT='(1X,A25)') 'ENTER NAME OF GRAPH FILE:'
      READ(5,FMT='(A12)',ERR=10) FILENAME
      WRITE(6,FMT='(1X)')
 11   WRITE(6,FMT='(1X,A27)') 'ENTER A LABEL FOR THE FILE:'
      READ(5,FMT='(A79)',ERR=11) LABEL
      WRITE(6,FMT='(1X)')
C
      OPEN(11,FILE=FILENAME,ERR=10)
      REWIND 11
C
      WRITE(11,FMT='(1X,A79)') LABEL
      WRITE(11,FMT='(1X)')
      DO 15 I=1,23
        WRITE(11,FMT='(1X,79A1)') (SCREEN(I,J),J=1,79)
 15   CONTINUE
C
 16   WRITE(11,FMT='(1X)')
      WRITE(11,FMT='(1X,A13,2X,F6.2,A29,F6.2,A2)')
     &                 'CASUALTIES = ',CASUAL,
     &                 '%  FOR A HIGHEST CORE TEMP OF',MAXTRE,
     &                 'oC'
      WRITE(6,FMT='(1X,A19,A36)') 'DO YOU WANT TO SAVE',
     &              ' TEMPERATURE VS. TIME PROFILE (Y/N)?'
C
      READ(5,FMT='(A1)',ERR=16) ANS
      WRITE(6,FMT='(1X)')
C
      IF (ANS .EQ. 'y' .OR. ANS .EQ. 'Y') THEN
        WRITE(11,FMT='(1X,A10,3X,A30)')
     &                 'TIME','CORE TEMPERATURE'
        WRITE(11,FMT='(1X,A10,3X,A30)')
     &                 '----','---- -----------'
        WRITE(11,FMT='(1X)')
C
        DO 17 IT=1,N-1
          WRITE(11,FMT='(1X,F10.2,3X,F20.2)')
     &                VALUE(1,IT),VALUE(2,IT)
 17     CONTINUE
      ENDIF
C
      CLOSE(11)
C
      RETURN
      END
C ** S **
      SUBROUTINE SCALER (TIM,SCALE)
      REAL TIM, SCALE
C
      IF (TIM .LE. 1.) THEN
        SCALE=1.
      ELSE IF (TIM .LE. 5.) THEN
        SCALE=5.
      ELSE IF (TIM .LE. 10.) THEN
        SCALE = 10.
      ELSE IF (TIM .LE. 50.) THEN
        SCALE = 50.
```

```
      ELSE IF (TIM .LE. 100.) THEN
        SCALE = 100.
      ELSE IF (TIM .LE. 500.) THEN
        SCALE = 500.
      ELSE
        SCALE = TIM
      ENDIF
C
      RETURN
      END
C ** S **
      SUBROUTINE SET (SCREEN,COLMIN,COLMAX,ROWMIN,ROWMAX,TMAX,TMIN)
      INTEGER COLMIN, COLMAX, I, J, ROWMIN, ROWMAX
      REAL TMAX, TMIN
      CHARACTER*1 SCREEN, LINE
C
      DIMENSION SCREEN(24,80), LINE(3)
C
      LINE(1)='¦'
      LINE(2)='-'
C
      DO 20 I=1,24
        DO 10 J=1,80
          SCREEN(I,J)=' '
 10     CONTINUE
 20   CONTINUE
C
      DO 30 I=ROWMIN,ROWMAX
        SCREEN(I,COLMIN)=LINE(1)
 30   CONTINUE
C
      DO 40 J=COLMIN,COLMAX
        SCREEN(ROWMAX,J)=LINE(2)
 40   CONTINUE
C
      SCREEN(1,8)='C'
      SCREEN(1,9)='o'
      SCREEN(1,10)='r'
      SCREEN(1,11)='e'
      SCREEN(1,13)='T'
      SCREEN(1,14)='e'
      SCREEN(1,15)='m'
      SCREEN(1,16)='p'
      SCREEN(1,17)='e'
      SCREEN(1,18)='r'
      SCREEN(1,19)='a'
      SCREEN(1,20)='t'
      SCREEN(1,21)='u'
      SCREEN(1,22)='r'
      SCREEN(1,23)='e'
      SCREEN(1,25)='('
      SCREEN(1,26)='o'
      SCREEN(1,27)='C'
      SCREEN(1,28)=')'
      SCREEN(23,36)='T'
      SCREEN(23,37)='i'
      SCREEN(23,38)='m'
      SCREEN(23,39)='e'
      SCREEN(23,41)='('
      SCREEN(23,42)='m'
      SCREEN(23,43)='i'
      SCREEN(23,44)='n'
```

```
      SCREEN(23,45)=')'
C
      CALL YAXIS(SCREEN, ROWMIN, ROWMAX, COLMIN, TMIN, TMAX)
C
      RETURN
      END
C ** S **
      SUBROUTINE SHOW (SCREEN)
      INTEGER I,J
      CHARACTER*1 SCREEN
C
      DIMENSION SCREEN(24,80)
C
      DO 20 I=1,23
          WRITE(6,FMT='(1X,79A1)') (SCREEN(I,J),J=1,79)
 20   CONTINUE
C
      RETURN
      END
C **T**
      SUBROUTINE TCORE(AREA, CLO, DEHYD, DIH, PATM,
     &              GAMMAC, GAMMAI, HUMID, IMCLO,
     &              METAB, WEX, SKIN, TEMPC, WIND,
     &              TREF, TAU, TLAG, PCAS, DTREFA, M,
     &              EDIF)
C*****************************************************************
C       Subroutine TCORE performs all calculations required
C       to determine Equilibrium Core Temperature as a function
C       of heat stress.
C       Rate equations taken from ED-SP-75011.  Acclimatization
C       equations from W. Matthews, USARIEM, December 1989.
C       Referenced by:  Main Program
C       External Reference:  ERFCTN
C*****************************************************************

      REAL A, AREA, B, C, CLO, CLOSTR, D, DEHYD, DELT, DF, DIH,
     &     DTREFA, DTREFD, EMAX, EREQ, EDIF, GAMMAC, GAMMAI,
     &     HUMID, IMCLO, IMSTR, M, MEAN, METAB, MODZ, PATM, PCAS,
     &     PS, PW, SKIN, STDDEV, T, TAU, TLAG,
     &     TEMPC, TREF, VEFF, WIND, X, XP
      DATA A,B,C,D /3.2437814, 5.86826E-3, 1.1702379E-8,
     &              2.1878462E-3 /
C
C     CALCULATE ENERGY EXPENDITURE SENSITIVE PARAMETERS
C
      M=METAB-WEX
C
C     CALCULATE WIND SPEED SENSITIVE PARAMETERS
C
      VEFF = WIND + 0.004*(METAB-105.)
      CLOSTR = CLO*VEFF**(-GAMMAC)
      IMSTR = IMCLO*VEFF**GAMMAI
CR
CR          CALCULATION OF THE SATURATION WATER PRESSURE PW
CR          AND THE VAPOR PRESSURE OVER THE SKIN PS WHEN=>
CR          T IS THE ABSOLUTE TEMPERATURE
CR          A, B, C, AND D ARE COEFFICIENTS FOR AN
CR          EMPIRICAL CALCULATION
CR          AND X AND XP ARE INTERMEDIATE VALUES.
CR
      T = TEMPC+273.16
      X = 647.27-T
```

```
      XP = (X/T)*( (A+B*X+C*X**3)/(1.+D*X) )
      PW = 218.167*10**(-XP) * PATM
C
      T = SKIN+273.16
      X = 647.27-T
      XP = (X/T)*( (A+B*X+C*X**3)/(1.+D*X) )
      PS = 218.167*10**(-XP) * PATM
C
C     CALCULATE WET HEAT EXCHANGE COMPONENTS
C
      EREQ = M + 6.47*AREA*(TEMPC-SKIN)/CLOSTR
      EMAX = 14.21*AREA*IMSTR*(PS-0.01*HUMID*PW)
      EDIF= EMAX-EREQ
CR
CR      IF (EDIF .LT. 0) THEN
CR        WRITE(6,*) ' EDIF WAS FOUND TO BE ',EDIF
CR        WRITE(6,*) ' WHEN M = ',M,'   TEMPC = ',TEMPC,
CR     &             '  AND RELATIVE HUMIDITY = ',HUMID
CR      ENDIF
CR
C
CR
CR       THE COEFFICIENT FOR H(R+C)
CR       WAS ORIGINALLY .014(.0022x6.45)
CR       BUT WAS MODIFIED TO .0011x6.45 (.01095) per L. Stroschein)
CR
      TREF = 36.75 + 0.004*M +
     &      (0.0011*6.45*AREA/CLOSTR)*(TEMPC-SKIN)+
     &       0.8*EXP( 0.0047*(- EDIF ) )
C
C       CALCULATE EFFECTS OF ACCLIMATIZATION ON CORE TEMPERATURE
C
C      DTREFA = (0.5 + 1.2 * (1.0 - EXP((37.15 - TREF)/2.0)))
C     &        *(1.0 - EXP(-.005*EMAX)) * (EXP(-0.3 * DIH))
C
C
C         CALCULATE EFFECTS OF DEHYDRATION ON CORE TEMPERATURE
C               REGRESSION EQUATION BASED ON MICHAEL N. SAWKA
C               REPORT, "THERMOREGULATORY AND BLOOD RESPONSES
C               DURING EXERCISE AT GRADED HYPOHYDRATION LEVELS"
C
C
C       ***  CAUTION!!!  THE FOLLOWING EQUATIONS FOR DEHYDRATION
C       ***  ARE JUST A TEST CASE.  FURTHER INVESTIGATION IS
C       **** BEING DONE TO VERIFY THIS ALGORITHM
C
        DTREFD = (0.1735) * DEHYD - 0.215
C
C       ***  DEHYDRATION >= 5% IS REPORTED TO COMPLETELY
C       ***  REDUCE THE EFFECT OF ACCLIMATIZATION.
C       ***  AS A RESULT, THE FOLLOWING FUNCTION IS
C       ***  BEING EVALUATED AGAINST THE DATA
C       ***  TO MODIFY THE DIH VALUE
C
      DF= MIN(1.,DEHYD/5.)
CR
CR      WRITE(6,*) ' THE VALUE OF EXP((37.15-TREF)/2) ',
CR     &            'FOR TREF=',TREF,' IS ',EXP((37.15 - TREF)/2.)
CR      WRITE(6,*) ' THE VALUE OF EXP(-.005*EMAX ',
CR     &           'FOR EMAX=',EMAX,' IS ',EXP(-.005*EMAX)
CR      WRITE(6,*) ' THE VALUE OF EXP(-0.3*DIH)',
CR     &            'FOR DIH=',DIH,' AND DF=',DF,' IS ',
```

```
CR     &             EXP(-0.3*DIH*(1.-DF))
CR
      DTREFA = (0.5 + 1.2 * (1.0 - EXP((37.15 - TREF)/2.0)))
     &        *(1.0 - EXP(-.005*EMAX)) * (EXP(-0.3*DIH*(1.-DF)))

C
C       ***  THE ABOVE EQUATIONS FOR DEHYDRATION
C       ***  ARE STILL BEING TESTED FOR VALIDITY
C
C
      TREF = TREF + DTREFA + DTREFD
      DELT = TREF - 36.75
      CALL PRBCAS(TREF,PCAS)
      TAU = 0.5 + 1.5*EXP(-0.3*DELT)
      TLAG = 58./METAB
C
      RETURN
      END
C ** T **
      SUBROUTINE TRETIM (VALUE, TIME, TREF, DTREFA, M, EDIF,
     &                   EQUIL, LIMIT)
      INTEGER ENTRY, EQUIL, DELTIM, DELT, I, LAST, LASTTM,
     &        OLDTIM, START, T, TMBEG, TMEND
      REAL CPEFF, M, ED, EDIF, DELTM, DTREF, DTREFA,
     &     RISE, TDELAY, TIM, TIME,
     &     TRBEG, TREF, TREND, TRET, VALUE
      CHARACTER*1 ANS
      LOGICAL DELAY, LIMIT, NEWMET, REPEAT, REST
C
      DIMENSION VALUE(2,2048)
      DIMENSION M(128), TIME(128), TREF(128), EDIF(128)
C
      DELTIM=MAX(5,INT(TIME(EQUIL))/1024)
      OLDTIM=0
C
      WRITE(6,FMT='(1X)')
 10   IF (.NOT. LIMIT) THEN
        WRITE(6,FMT='(1X,A45,1X,I5,1X,A12)')
     &            'DO YOU WANT TO CHANGE THE TIME INTERVAL FROM',
     &             DELTIM,'(min)? (Y/N)'
        READ(5,FMT='(A1)',ERR=10) ANS
        WRITE(6,FMT='(1X)')
      ENDIF
C
 20   IF (ANS .EQ. 'N' .OR. ANS .EQ. 'n'.OR. LIMIT) THEN
C
          LAST=0
          TRET=37.
          RISE=0.
        DO 30 I=1,2048
          VALUE(1,I)=0.
          VALUE(2,I)=0.
 30     CONTINUE
C
        DO 100 I=1,EQUIL
C
          NEWMET=.FALSE.
C
C  Set the rest flag if the people are not at work
C    to start a recovery period
C
          IF (M(I) .LE. 105.) THEN
```

```
            REST=.TRUE.
          ELSE
            REST=.FALSE.
          ENDIF
C
C  Set the begining time for each assessment cycle
C    Use the NEWMET flag to identify a change in
C    metabolic rate.  This flag is used to assert weather
C    or not a time delay is used in calculating the change
C    in core temperature values.
C
          IF (I .EQ. 1) THEN
            TMBEG=0
            NEWMET=.TRUE.
          ELSE
            TMBEG=INT(TIME(I))
            IF (ABS(M(I)-M(I-1)) .GE. 1.) NEWMET=.TRUE.
          ENDIF
C
C  Set the time delay.  For recovery periods the time
C    delay is based on the cooling power (set by
C    the difference between Ereq and Emax.
C  The time delay for the work conditions is based on
C    the change in the level of energy expenditures
C    No time delay is generated for work at the same
C    energy expenditure.
C
          IF (REST) THEN
            CPEFF=0.015*EDIF(I)
            TDELAY=MIN(15.,15.*EXP(-0.5*CPEFF))
          ELSE
            IF (I .EQ. 1) THEN
              TDELAY=3480./M(1)
            ELSE IF (NEWMET) THEN
              TDELAY=3480./(105.+ABS(M(I)-M(I-1)))
            ELSE
              TDELAY=0.
            ENDIF
          ENDIF
C
          TRBEG=TRET
          IF (I .LT. EQUIL) THEN
            TREND=TREF(I)
            TMEND=INT(TIME(I+1))
          ELSE IF (I .EQ. EQUIL) THEN
            TREND=TREF(EQUIL)
            TMEND=LASTTM(TMBEG, TRBEG, TREND, TDELAY,
     &                   DTREFA, CPEFF)
          ENDIF
          DTREF=TREND-TRBEG
C
          IF (TDELAY .GT. REAL(TMEND-TMBEG))
     &      WRITE(6,FMT='(1X,A11,F7.2,A22,I5,A5,
     &                          I5,A8,/,1X,A17,A30)')
     &                 'A DELAY OF ',TDELAY,
     &                 ' IS NECESSARY BETWEEN ',TMBEG,' AND ',
     &                  TMEND,' minutes','TO ACCOMPLISH THE',
     &                 ' APPROPRIATE CHANGE IN ACTIVITY'
C
CR
CR        WRITE(6,*) ' LOOPING FOR TIME # ',I
CR        WRITE(6,*) ' THE RANGE OF TIMES ARE [',TMBEG,TMEND,']'
```

```
CR          WRITE(6,*) ' THE RANGE OF TRES ARE [',TRBEG,TREND,']'
CR
            DELAY=.FALSE.
            REPEAT=.FALSE.
C
            IF (I .EQ. 1) THEN
              START=0
            ELSE
              START=TMBEG+1
            ENDIF
C
            IF (INT(TDELAY) .GT. 0) THEN
              DO 80 T=START,TMBEG+INT(TDELAY)
C
C       The logic that follows allows the delta in core
C        temperature, DTREF,  to vary during the delay time.
C        While the equilibrium value remains the same, the core
C        temperature calculated at any time, TRET, is modified
C        during a change in metabolic rate (from changing the
C        work load or from starting a recovery time period.
C        Note that the temperature at the delay time is always
C        calculated as long as it occurs before the end of the
C        time window being portrayed.
C
C        (Conversation with Mr. Leander Stroschein on 27 April
C        1990.)
C
                TIM=REAL(T)
                DELTM=REAL(T-TMBEG)
                DTREF=TREND-TRET
                TRBEG=TRET
                DELT=T-OLDTIM
                OLDTIM=T
C
                CALL ATTIME (TRET, TRBEG, DTREF, DTREFA, DELTM,
     &                       DELT, TDELAY, RISE, CPEFF, LAST,
     &                       TIM, VALUE, NEWMET, REST)
C
CR
CR              WRITE(6,*) ' IN LOOP 80   DELAY > 0 '
CR              WRITE(6,*) ' FOR TIME OF ',TIM
CR              WRITE(6,*) '            WITH A DELAY OF ',TDELAY
CR              WRITE(6,*) '  TRET=',TRET,' DELTA TRE = ',DTREF
CR

 80             CONTINUE
                TRBEG=TRET
            ENDIF
C
C  The DO 90 LOOP calculates the core temperature for time
C     increments of DELTIM from the end of the time delay (if
C     any, to the final time.
C
            IF (INT(TDELAY) .GT. 0) THEN
              START=TMBEG+INT(TDELAY)+1
            ELSE IF (I .EQ. 1) THEN
              START=1
            ELSE
              START=TMBEG+1
            ENDIF
C
            DO 90 T=START,TMEND,DELTIM
```

```
C
            TIM=REAL(T)
            DELTM=REAL(T-TMBEG)
            DELT=T-OLDTIM
            OLDTIM=T
C
            CALL ATTIME (TRET, TRBEG, DTREF, DTREFA, DELTM,
     &                   DELT, TDELAY, RISE, CPEFF, LAST,
     &                   TIM, VALUE, NEWMET, REST)
C
CR
CR          WRITE(6,*) ' IN LOOP 90 '
CR          WRITE(6,*) ' BETWEEN ',START,
CR     &               ' AND ',TMEND
CR          WRITE(6,*) ' FOR TIME OF ',TIM
CR          WRITE(6,*) '  TRET=',TRET,' DELTA TRE = ',DTREF
CR
 90       CONTINUE
C
          IF (TIM .LT. REAL(TMEND)) THEN
            DELTM=REAL(TMEND-TMBEG)
            TIM=REAL(TMEND)
            DELT=TMEND-OLDTIM
            OLDTIM=TMEND
C
            CALL ATTIME (TRET, TRBEG, DTREF, DTREFA, DELTM,
     &                   DELT, TDELAY, RISE, CPEFF, LAST,
     &                   TIM, VALUE, NEWMET, REST)
CR
CR          WRITE(6,*)
CR          WRITE(6,*) '       AT THE LAST TIME OF THE GROUP '
CR          WRITE(6,*) ' FOR TIME OF ',TIM
CR          WRITE(6,*) '  TRET=',TRET,' DELTA TRE = ',DTREF
CR
C
          ENDIF
 100    CONTINUE
       ELSE IF (ANS .EQ. 'Y' .OR. ANS .EQ. 'y') THEN
 110    WRITE(6,FMT='(1X,A39)')
     &          'ENTER THE NEW TIME INTERVAL IN MINUTES:'
        READ(5,*,ERR=110) ENTRY
        IF (ENTRY .GT. 14400) THEN
          WRITE(6,FMT='(1X,I10,1X,A17)')
     &             ENTRY,'GREATER THAN 1 DAY'
          WRITE(6,FMT='(1X,A16)')
     &           'PLEASE TRY AGAIN'
          WRITE(6,FMT='(1X)')
          GOTO 110
        ELSE IF (INT(TIME(EQUIL))/DELTIM .GT. 1024) THEN
          WRITE(6,FMT='(1X,I10,1X,A31,1X,A22)')
     &             INT(TIME(EQUIL))/DELTIM,
     &            'TIME PERIODS REQUESTED WHEN THE',
     &            'MAXIMUM NUMBER IS 1024'
          WRITE(6,FMT='(1X)')
          WRITE(6,FMT='(1X,A22,1X,I5)')
     &            'TRY A TIME LARGER THAN',
     &             INT(TIME(EQUIL))/1024
          WRITE(6,FMT='(1X)')
          GOTO 110
        ELSE
          DELTIM=ENTRY
          GOTO 10
```

```
        ENDIF
      ENDIF
C
      LAST=LAST+1
      VALUE(1,LAST)=999.
      VALUE(2,LAST)=999.
CR
CR    WRITE(6,*) ' *** THE LAST VALUE WAS ',LAST,'***'
CR
C
      RETURN
      END
C **W**
      SUBROUTINE WORK (TRET, TRE0, DTREF, DTREFA, TIME, DELAY,
     &                 RISE, DELT, NEWMET)
      INTEGER DELT
      REAL DTREF, DTREFA, DTREFC, KWRK, DELAY, OLDTRE,
     &     TRE0, TRET, TIME
      LOGICAL NEWMET
C
C   The exponential coefficient for the change of core temperature
C      during work uses the change in core temperature without the
C      benefit of acclimatization.
C
C   The time delay equation -- DELAY = 3480 / M uses the value
C      of net metabolic rate when there is a change of metabolic
C      rate and DELAY = 0 if there is no change in metabolic
C      rate.
C   Further note that during the delay time, the core temperature
C     continues to rise at 1/2 the rate per minute that it was
C     rising during the previous time period and that the maximum
C     core temperature that will be achieved will ultimately be
C     used to define the delta that will be used by the recovery
C     period.
C
C       (Conversation with Mr. Leander Stroschein on 27 April
C       1990.)
C
C


      OLDTRE=TRET
      DTREFC=MAX(0.,DTREF-DTREFA)
      KWRK=(1.+3.*EXP(-.3*(DTREFC)))/120.
CR
CR      WRITE(6,*) ' KWRK ',KWRK,'  DTREF ',DTREF,
CR     &           '  DTREFA ',DTREFA
CR
C
      IF (TIME .GT. DELAY .OR. DELAY .EQ. 0. .OR.
     &    .NOT. NEWMET) THEN
        TRET=TRE0 + DTREF*(1.-EXP(-KWRK*(TIME-DELAY)))
        IF (DELT .GT. 0) RISE=(TRET-OLDTRE)/REAL(DELT)
CR
CR        WRITE(6,*) ' IN FIRST OPTION TRET=',TRET,' RISE ',RISE
CR
      ELSE
        TRET=TRE0 + RISE*(DELAY-TIME)/DELAY +
     &              TIME/DELAY*DTREF*(1.-EXP(-KWRK))
CR
CR        WRITE(6,*) ' ',TRE0,' IN SECOND OPTION TRET= ',TRET
CR        WRITE(6,*) ' FIRST TERM= ',RISE*(DELAY-TIME)/DELAY
CR        WRITE(6,*) ' SECOND TERM=',TIME/DELAY*
```

```
CR      &                DTREF*(1.-EXP(-KWRK))
CR         WRITE(6,*) ' RISE= ',RISE,'  DELAY= ',DELAY,
CR      &               '  TIME= ',TIME
CR
        ENDIF
CR
CR        WRITE(6,*) ' FOR WORKING TIME=',TIME
CR        WRITE(6,*) ' THE STARTING CORE TEMPERATURE OF    ',TRE0
CR      WRITE(6,*) ' AND THE ENDING CORE TEMPERATURE OF ',TRE0+DTREF
CR        WRITE(6,*) ' RESULTED IN A TEMPERATURE OF       ',TRET
CR        WRITE(6,*) ' WITH A RATE OF RISE OF             ',RISE
CR
        RETURN
        END
C **X**
        SUBROUTINE XAXIS (SCREEN, COLMIN, COLMAX, ROWMAX, SCALE)
        INTEGER COLMAX, COLMIN, I, ROWMAX, XTIC, XLABEL
        REAL SCALE
        CHARACTER*1 SCREEN
C
        DIMENSION SCREEN(24,80), XTIC(6), XLABEL(6)
C
C
        DO 10 I=1,6
          XTIC(I)=COLMIN + NINT((COLMAX-COLMIN)*FLOAT(I-1)/5.)
          IF (XTIC(I) .GT. COLMAX) THEN
            XTIC(I)=COLMAX
          ELSE IF (XTIC(I) .LT. COLMIN) THEN
            XTIC(I)=COLMIN
          ENDIF
C
          SCREEN(ROWMAX,XTIC(I))='+'
          XLABEL(I)=NINT(SCALE*FLOAT(I-1)/5.)
CR
CR        WRITE(6,*) ' XTIC AT ',I,XTIC(I),' SHOULD BE ',XLABEL(I)
CR
          CALL DIGIT(XTIC(I), XLABEL(I), SCREEN, ROWMAX, 'X')
 10     CONTINUE
C
        RETURN
        END
C **Y**
        SUBROUTINE YAXIS(SCREEN,ROWMIN,ROWMAX,COLMIN,TMIN,TMAX)
        INTEGER I, ROW, ROWMIN, ROWMAX, COLMIN
        REAL TMIN, TMAX, YSCALE
        CHARACTER*1 SCREEN, LINE
C
        DIMENSION SCREEN(24,80), LINE(3)
C
        LINE(3)='+'
C
        YSCALE=REAL(ROWMAX-ROWMIN)/REAL(NINT(TMAX)-INT(TMIN))
C
        DO 10 I=INT(TMIN),NINT(TMAX)
          IF (I .EQ. INT(TMIN)) THEN
            ROW=ROWMAX
          ELSE IF (I .EQ. NINT(TMAX)) THEN
            ROW=ROWMIN
          ELSE
            ROW=ROWMAX-NINT((REAL(I)-TMIN)*YSCALE)
          ENDIF
C
```

```
          SCREEN(ROW,COLMIN)=LINE(3)
          CALL DIGIT(COLMIN, I, SCREEN, ROW, 'Y')
C
 10     CONTINUE
C
        RETURN
        END
```

APPENDIX C
Example of Goldman-Givoni Input Files and Resulting Outputs

The Goldman-Givoni model, as used at SAIC, was written to be an interactive model. The model gives the user a menu with which the user can set the appropriate meteorological conditions, clothing type, work intensity, etc. for a specified time period. Table C-1 shows a portion of this menu.

Table C-1. Menu Choices from Goldman-Givoni Model

Menu Choice	Description	Default Value
1	Ambient Temperature (°C)	20
2	Relative Humidity (%)	20
3	Wind Speed (m/s)	3
4	Metabolic Rate (Watts)	105
5	External Workload	0
6	Clo	1.13
7	Im/Clo	0.43
8	Gamma for Clo	0.26
9	Gamma for Im/Clo	0.255
10	Skin Temperature (°C)	38
11	Days of Acclimatization	12
12	Dehydration (%)	0
99	Beginning Time for Conditions (Minutes)	0

The following is an example of a file used as inputs for the Goldman-Givoni model. Inputs were stored in a file and subsequently used via file redirection to facilitate more reproducible results and to minimize potential input errors. The file begins with an "I" in answer to the Goldman-Givoni question: "(I)nteractive or Metabolic (L)imit mode?" After this, the inputs are set up with a Menu Choice (number shown in table above) followed by the desired value. The case shown is for an individual in BDO4 over BDUs, unacclimatized at 2% dehydration, working at 300 Watts and implementing FM21-10 work/rest cycles.

Goldman-Givoni Input File

```
I
1
31.1
2
46.4
3
2.9
4
300
6
2.0
7
.16
8
.17
9
.25
11
0.
12
2.
99
20
4
105
99
60
4
300
99
80
4
105
99
120
4
300
99
140
4
105
99
180
4
300
99
200
4
105
99
```

Goldman-Givoni Input File (continued)

```
240
4
300
99
260
4
105
99
300
4
300
99
320
4
105
99
360
4
300
99
380
4
105
99
420
1
35.6
2
34.1
3
4.6
4
300
99
440
4
105
99
480
4
300
99
500
4
105
99
540
4
300
99
560
4
```

Goldman-Govini Input File (continued)

```
105
99
600
4
300
99
620
4
105
99
660
1
40.9
2
20.26
3
6.4
4
300
99
680
4
105
99
720
4
300
99
740
4
105
99
780
4
300
99
800
4
105
99
840
4
300
99
860
4
105
99
900
1
39.1
2
```

Goldman-Govini Input File (continued)

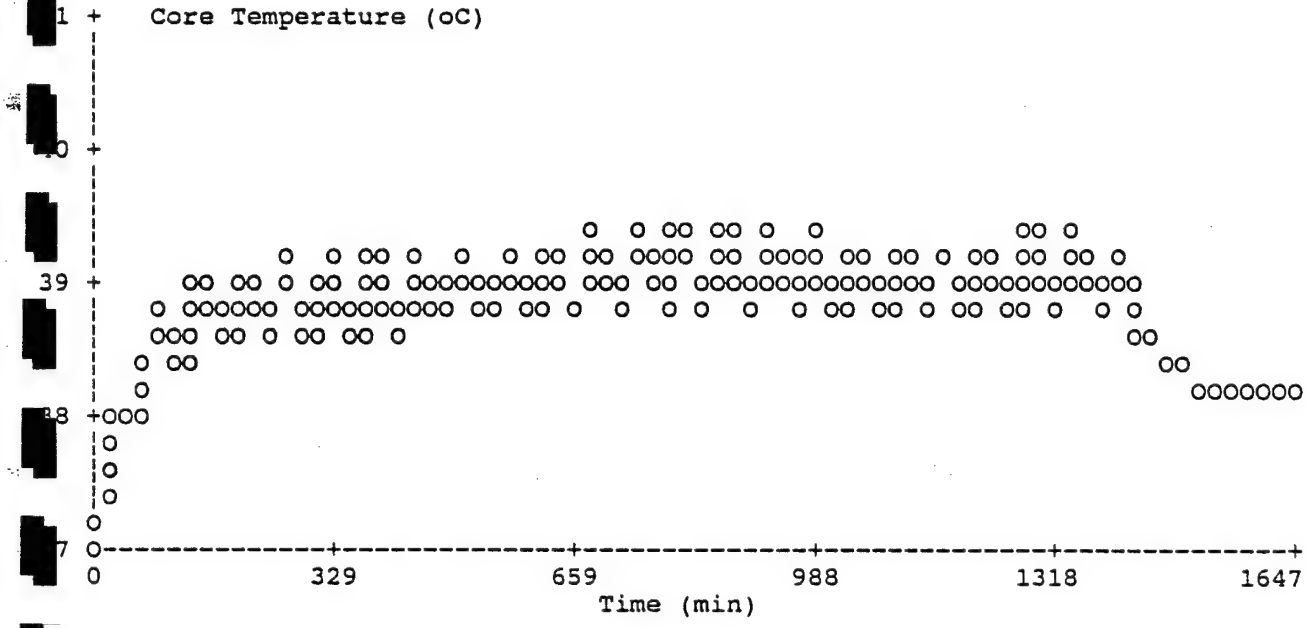
```
21.4
3
6.1
4
300
99
920
4
105
99
960
4
300
99
980
4
105
99
1020
4
300
99
1040
4
105
99
1080
4
300
99
1100
4
105
99
1140
1
34.5
2
39.13
3
3.3
4
300
99
1160
4
105
99
1200
4
300
99
```

Goldman-Givoni Input File (continued)

```
1220
4
105
99
1260
4
300
99
1280
4
105
99
1320
4
300
99
1340
4
105
99
1380
1
31.1
2
46.4
3
2.9
4
300
99
1400
4
105
0
N
Y
02H10300.GBB
BDU+BDO4-A0D2--FM21-10 HIGHEST W/R RATIO -- WMR: 300 WATTS
Y
Y
```

Goldman-Givoni Output File

BDU+BDO4-AOD2--FM21-10 HIGHEST W/R RATIO -- WMR: 300 WATTS



CASUALTIES = 43.40% FOR A HIGHEST CORE TEMP OF 39.41oC

TIME	CORE TEMPERATURE
.00	37.00
1.00	37.01
2.00	37.02
3.00	37.03
4.00	37.05
5.00	37.08
6.00	37.11
7.00	37.15
8.00	37.19
9.00	37.24
10.00	37.29
11.00	37.34
12.00	37.37
17.00	37.65
20.00	37.80
21.00	37.85
22.00	37.89
23.00	37.92
24.00	37.95

Goldman-Givoni Output File (continued)

25.00	37.97
26.00	37.98
27.00	37.99
28.00	37.99
33.00	38.01
38.00	38.03
43.00	38.05
48.00	38.07
53.00	38.08
58.00	38.09
60.00	38.10
61.00	38.11
62.00	38.12
63.00	38.13
64.00	38.15
65.00	38.17
66.00	38.20
67.00	38.22
68.00	38.26
69.00	38.29
70.00	38.33
71.00	38.37
72.00	38.39
77.00	38.60
80.00	38.71
81.00	38.74
82.00	38.77
83.00	38.78
84.00	38.79
85.00	38.80
86.00	38.79
87.00	38.78
88.00	38.78
93.00	38.72
98.00	38.66
103.00	38.61
108.00	38.57
113.00	38.53
118.00	38.49
120.00	38.48
121.00	38.48
122.00	38.48
123.00	38.49
124.00	38.50
125.00	38.51
126.00	38.53
127.00	38.55
128.00	38.58
129.00	38.60
130.00	38.64

Goldman-Givoni Output File (continued)

131.00	38.67
132.00	38.69
137.00	38.87
140.00	38.96
141.00	38.99
142.00	39.01
143.00	39.02
144.00	39.03
145.00	39.02
146.00	39.02
147.00	39.00
148.00	38.99
153.00	38.91
158.00	38.83
163.00	38.77
168.00	38.70
173.00	38.65
178.00	38.60
180.00	38.58
181.00	38.58
182.00	38.58
183.00	38.58
184.00	38.59
185.00	38.60
186.00	38.62
187.00	38.64
188.00	38.66
189.00	38.69
190.00	38.72
191.00	38.75
192.00	38.77
197.00	38.94
200.00	39.03
201.00	39.06
202.00	39.07
203.00	39.08
204.00	39.09
205.00	39.08
206.00	39.07
207.00	39.06
208.00	39.05
213.00	38.96
218.00	38.88
223.00	38.81
228.00	38.74
233.00	38.68
238.00	38.63
240.00	38.61
241.00	38.61
242.00	38.60

Goldman-Givoni Output File (continued)

243.00	38.61
244.00	38.61
245.00	38.63
246.00	38.64
247.00	38.66
248.00	38.68
249.00	38.71
250.00	38.74
251.00	38.78
252.00	38.79
257.00	38.96
260.00	39.05
261.00	39.07
262.00	39.09
263.00	39.10
264.00	39.10
265.00	39.10
266.00	39.09
267.00	39.07
268.00	39.06
273.00	38.97
278.00	38.89
283.00	38.82
288.00	38.75
293.00	38.69
298.00	38.64
300.00	38.62
301.00	38.61
302.00	38.61
303.00	38.61
304.00	38.62
305.00	38.63
306.00	38.65
307.00	38.67
308.00	38.69
309.00	38.72
310.00	38.75
311.00	38.78
312.00	38.80
317.00	38.96
320.00	39.05
321.00	39.08
322.00	39.09
323.00	39.10
324.00	39.11
325.00	39.10
326.00	39.09
327.00	39.08
328.00	39.07
333.00	38.98

Goldman-Givoni Output File (continued)

338.00	38.89
343.00	38.82
348.00	38.75
353.00	38.69
358.00	38.64
360.00	38.62
361.00	38.61
362.00	38.61
363.00	38.62
364.00	38.62
365.00	38.63
366.00	38.65
367.00	38.67
368.00	38.69
369.00	38.72
370.00	38.75
371.00	38.78
372.00	38.80
377.00	38.97
380.00	39.06
381.00	39.08
382.00	39.10
383.00	39.11
384.00	39.11
385.00	39.11
386.00	39.10
387.00	39.08
388.00	39.07
393.00	38.98
398.00	38.89
403.00	38.82
408.00	38.75
413.00	38.69
418.00	38.64
420.00	38.62
421.00	38.62
422.00	38.61
423.00	38.62
424.00	38.63
425.00	38.64
426.00	38.66
427.00	38.68
428.00	38.70
429.00	38.73
430.00	38.76
431.00	38.80
432.00	38.82
437.00	39.00
440.00	39.10
441.00	39.12

Goldman-Givoni Output File (continued)

442.00	39.14
443.00	39.16
444.00	39.16
445.00	39.16
446.00	39.16
447.00	39.14
448.00	39.14
453.00	39.05
458.00	38.98
463.00	38.91
468.00	38.84
473.00	38.79
478.00	38.74
480.00	38.72
481.00	38.71
482.00	38.71
483.00	38.71
484.00	38.72
485.00	38.73
486.00	38.75
487.00	38.77
488.00	38.79
489.00	38.82
490.00	38.85
491.00	38.89
492.00	38.90
497.00	39.08
500.00	39.17
501.00	39.20
502.00	39.21
503.00	39.22
504.00	39.23
505.00	39.23
506.00	39.22
507.00	39.21
508.00	39.20
513.00	39.11
518.00	39.03
523.00	38.95
528.00	38.88
533.00	38.82
538.00	38.77
540.00	38.75
541.00	38.74
542.00	38.74
543.00	38.74
544.00	38.75
545.00	38.76
546.00	38.78
547.00	38.80

Goldman-Givoni Output File (continued)

548.00	38.82
549.00	38.85
550.00	38.88
551.00	38.91
552.00	38.93
557.00	39.10
560.00	39.19
561.00	39.21
562.00	39.23
563.00	39.24
564.00	39.25
565.00	39.25
566.00	39.24
567.00	39.22
568.00	39.22
573.00	39.12
578.00	39.04
583.00	38.96
588.00	38.89
593.00	38.83
598.00	38.78
600.00	38.75
601.00	38.75
602.00	38.75
603.00	38.75
604.00	38.76
605.00	38.77
606.00	38.78
607.00	38.80
608.00	38.83
609.00	38.85
610.00	38.88
611.00	38.92
612.00	38.93
617.00	39.10
620.00	39.20
621.00	39.22
622.00	39.24
623.00	39.25
624.00	39.25
625.00	39.25
626.00	39.24
627.00	39.23
628.00	39.22
633.00	39.13
638.00	39.04
643.00	38.96
648.00	38.90
653.00	38.83
658.00	38.78

Goldman-Givoni Output File (continued)

660.00	38.76
661.00	38.75
662.00	38.75
663.00	38.75
664.00	38.76
665.00	38.77
666.00	38.79
667.00	38.81
668.00	38.84
669.00	38.87
670.00	38.90
671.00	38.94
672.00	38.96
677.00	39.14
680.00	39.24
681.00	39.27
682.00	39.29
683.00	39.31
684.00	39.31
685.00	39.32
686.00	39.31
687.00	39.30
688.00	39.28
689.00	39.27
694.00	39.18
699.00	39.11
704.00	39.04
709.00	38.97
714.00	38.92
719.00	38.87
720.00	38.86
721.00	38.85
722.00	38.85
723.00	38.86
724.00	38.86
725.00	38.88
726.00	38.89
727.00	38.91
728.00	38.94
729.00	38.97
730.00	39.00
731.00	39.04
732.00	39.05
737.00	39.23
740.00	39.32
741.00	39.35
742.00	39.37
743.00	39.38
744.00	39.39
745.00	39.39

Goldman-Givoni Output File (continued)

746.00	39.38
747.00	39.37
748.00	39.35
749.00	39.33
754.00	39.24
759.00	39.16
764.00	39.08
769.00	39.02
774.00	38.96
779.00	38.90
780.00	38.89
781.00	38.89
782.00	38.89
783.00	38.89
784.00	38.90
785.00	38.91
786.00	38.92
787.00	38.94
788.00	38.97
789.00	38.99
790.00	39.03
791.00	39.06
792.00	39.08
797.00	39.25
800.00	39.35
801.00	39.37
802.00	39.39
803.00	39.40
804.00	39.41
805.00	39.41
806.00	39.40
807.00	39.39
808.00	39.37
809.00	39.35
814.00	39.26
819.00	39.17
824.00	39.10
829.00	39.03
834.00	38.97
839.00	38.91
840.00	38.90
841.00	38.90
842.00	38.89
843.00	38.90
844.00	38.90
845.00	38.92
846.00	38.93
847.00	38.95
848.00	38.97
849.00	39.00

Goldman-Givoni Output File (continued)

850.00	39.03
851.00	39.07
852.00	39.08
857.00	39.26
860.00	39.35
861.00	39.38
862.00	39.40
863.00	39.41
864.00	39.41
865.00	39.41
866.00	39.41
867.00	39.39
868.00	39.37
869.00	39.36
874.00	39.26
879.00	39.18
884.00	39.10
889.00	39.03
894.00	38.97
899.00	38.92
900.00	38.90
901.00	38.90
902.00	38.90
903.00	38.90
904.00	38.90
905.00	38.91
906.00	38.93
907.00	38.95
908.00	38.97
909.00	38.99
910.00	39.02
911.00	39.06
912.00	39.07
917.00	39.23
920.00	39.32
921.00	39.34
922.00	39.36
923.00	39.37
924.00	39.37
925.00	39.36
926.00	39.35
927.00	39.33
928.00	39.31
933.00	39.21
938.00	39.12
943.00	39.04
948.00	38.97
953.00	38.90
958.00	38.84
960.00	38.82

Goldman-Givoni Output File (continued)

961.00	38.81
962.00	38.81
963.00	38.81
964.00	38.82
965.00	38.83
966.00	38.85
967.00	38.87
968.00	38.89
969.00	38.92
970.00	38.95
971.00	38.98
972.00	39.00
977.00	39.17
980.00	39.26
981.00	39.28
982.00	39.30
983.00	39.31
984.00	39.31
985.00	39.30
986.00	39.29
987.00	39.27
988.00	39.26
993.00	39.16
998.00	39.08
1003.00	39.00
1008.00	38.93
1013.00	38.87
1018.00	38.82
1020.00	38.79
1021.00	38.79
1022.00	38.79
1023.00	38.79
1024.00	38.80
1025.00	38.81
1026.00	38.82
1027.00	38.84
1028.00	38.87
1029.00	38.89
1030.00	38.93
1031.00	38.96
1032.00	38.98
1037.00	39.15
1040.00	39.24
1041.00	39.27
1042.00	39.28
1043.00	39.29
1044.00	39.29
1045.00	39.29
1046.00	39.28
1047.00	39.26

Goldman-Givoni Output File (continued)

1048.00	39.25
1053.00	39.15
1058.00	39.07
1063.00	38.99
1068.00	38.92
1073.00	38.86
1078.00	38.81
1080.00	38.79
1081.00	38.78
1082.00	38.78
1083.00	38.78
1084.00	38.79
1085.00	38.80
1086.00	38.82
1087.00	38.84
1088.00	38.86
1089.00	38.89
1090.00	38.92
1091.00	38.96
1092.00	38.97
1097.00	39.14
1100.00	39.24
1101.00	39.26
1102.00	39.28
1103.00	39.29
1104.00	39.29
1105.00	39.29
1106.00	39.28
1107.00	39.26
1108.00	39.24
1113.00	39.15
1118.00	39.06
1123.00	38.99
1128.00	38.92
1133.00	38.86
1138.00	38.81
1140.00	38.79
1141.00	38.78
1142.00	38.78
1143.00	38.78
1144.00	38.79
1145.00	38.80
1146.00	38.82
1147.00	38.83
1148.00	38.86
1149.00	38.89
1150.00	38.92
1151.00	38.95
1152.00	38.96
1157.00	39.14

Goldman-Givoni Output File (continued)

1160.00	39.23
1161.00	39.25
1162.00	39.27
1163.00	39.28
1164.00	39.29
1165.00	39.29
1166.00	39.29
1167.00	39.28
1168.00	39.26
1169.00	39.25
1174.00	39.16
1179.00	39.08
1184.00	39.00
1189.00	38.93
1194.00	38.87
1199.00	38.81
1200.00	38.80
1201.00	38.80
1202.00	38.79
1203.00	38.80
1204.00	38.80
1205.00	38.81
1206.00	38.83
1207.00	38.85
1208.00	38.87
1209.00	38.90
1210.00	38.93
1211.00	38.96
1212.00	38.98
1217.00	39.15
1220.00	39.24
1221.00	39.26
1222.00	39.28
1223.00	39.29
1224.00	39.30
1225.00	39.30
1226.00	39.29
1227.00	39.28
1228.00	39.27
1229.00	39.26
1234.00	39.17
1239.00	39.08
1244.00	39.01
1249.00	38.94
1254.00	38.87
1259.00	38.82
1260.00	38.81
1261.00	38.80
1262.00	38.80
1263.00	38.80

Goldman-Givoni Output File (continued)

1264.00	38.81
1265.00	38.82
1266.00	38.83
1267.00	38.85
1268.00	38.87
1269.00	38.90
1270.00	38.93
1271.00	38.96
1272.00	38.98
1277.00	39.15
1280.00	39.24
1281.00	39.26
1282.00	39.28
1283.00	39.29
1284.00	39.30
1285.00	39.30
1286.00	39.30
1287.00	39.29
1288.00	39.27
1289.00	39.26
1294.00	39.17
1299.00	39.08
1304.00	39.01
1309.00	38.94
1314.00	38.88
1319.00	38.82
1320.00	38.81
1321.00	38.80
1322.00	38.80
1323.00	38.80
1324.00	38.81
1325.00	38.82
1326.00	38.83
1327.00	38.85
1328.00	38.88
1329.00	38.90
1330.00	38.93
1331.00	38.97
1332.00	38.98
1337.00	39.15
1340.00	39.24
1341.00	39.26
1342.00	39.28
1343.00	39.29
1344.00	39.30
1345.00	39.30
1346.00	39.30
1347.00	39.29
1348.00	39.27
1349.00	39.26

Goldman-Givoni Output File (continued)

1354.00	39.17
1359.00	39.09
1364.00	39.01
1369.00	38.94
1374.00	38.88
1379.00	38.82
1380.00	38.81
1381.00	38.80
1382.00	38.80
1383.00	38.80
1384.00	38.80
1385.00	38.81
1386.00	38.83
1387.00	38.84
1388.00	38.86
1389.00	38.89
1390.00	38.91
1391.00	38.94
1392.00	38.96
1397.00	39.11
1400.00	39.19
1401.00	39.21
1402.00	39.22
1403.00	39.23
1404.00	39.23
1405.00	39.22
1406.00	39.21
1407.00	39.19
1408.00	39.18
1413.00	39.08
1418.00	38.98
1423.00	38.90
1428.00	38.82
1433.00	38.76
1438.00	38.70
1443.00	38.64
1448.00	38.59
1453.00	38.55
1458.00	38.51
1463.00	38.48
1468.00	38.45
1473.00	38.42
1478.00	38.39
1483.00	38.37
1488.00	38.35
1493.00	38.33
1498.00	38.32
1503.00	38.30
1508.00	38.29
1513.00	38.28

Goldman-Givoni Output File (continued)

1518.00	38.27
1523.00	38.26
1528.00	38.25
1533.00	38.24
1538.00	38.24
1543.00	38.23
1548.00	38.23
1553.00	38.22
1558.00	38.22
1563.00	38.21
1568.00	38.21
1573.00	38.21
1578.00	38.20
1583.00	38.20
1588.00	38.20
1593.00	38.20
1598.00	38.19
1603.00	38.19
1608.00	38.19
1613.00	38.19
1618.00	38.19
1623.00	38.19
1628.00	38.19
1633.00	38.19
1638.00	38.19
1643.00	38.18
1647.00	38.18

APPENDIX D
Comprehensive Listing of Study Results

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	NONE	105 Watts	0%	12 days	37.10	0.00	100.00
BDU	NONE	105 Watts	0%	8 days	37.14	0.00	100.00
BDU	NONE	105 Watts	0%	4 days	37.26	0.00	100.00
BDU	NONE	105 Watts	0%	0 days	37.66	.02	99.98
BDU	NONE	105 Watts	2%	12 days	37.50	.01	99.99
BDU	NONE	105 Watts	2%	8 days	37.57	.01	99.99
BDU	NONE	105 Watts	2%	4 days	37.71	.03	99.97
BDU	NONE	105 Watts	2%	0 days	38.01	.21	99.79
BDU	NONE	105 Watts	4%	12 days	38.06	.28	99.72
BDU	NONE	105 Watts	4%	8 days	38.14	.44	99.56
BDU	NONE	105 Watts	4%	4 days	38.23	.74	99.26
BDU	NONE	105 Watts	4%	0 days	38.36	1.39	98.61
BDU	NONE	105 Watts	6%	12 days	38.70	6.28	93.72
BDU	NONE	105 Watts	6%	8 days	38.70	6.28	93.72
BDU	NONE	105 Watts	6%	4 days	38.70	6.28	93.72
BDU	NONE	105 Watts	6%	0 days	38.70	6.28	93.72
BDU	NONE	150 Watts	0%	12 days	37.30	0.00	100.00
BDU	NONE	150 Watts	0%	8 days	37.34	0.00	100.00
BDU	NONE	150 Watts	0%	4 days	37.48	.01	99.99
BDU	NONE	150 Watts	0%	0 days	37.95	.15	99.85
BDU	NONE	150 Watts	2%	12 days	37.70	.03	99.97
BDU	NONE	150 Watts	2%	8 days	37.79	.05	99.95
BDU	NONE	150 Watts	2%	4 days	37.95	.15	99.85
BDU	NONE	150 Watts	2%	0 days	38.30	1.05	98.95
BDU	NONE	150 Watts	4%	12 days	38.30	1.05	98.95
BDU	NONE	150 Watts	4%	8 days	38.39	1.64	98.36
BDU	NONE	150 Watts	4%	4 days	38.50	2.76	97.24
BDU	NONE	150 Watts	4%	0 days	38.65	5.05	94.95
BDU	NONE	150 Watts	6%	12 days	38.99	16.53	83.47
BDU	NONE	150 Watts	6%	8 days	38.99	16.53	83.47
BDU	NONE	150 Watts	6%	4 days	38.99	16.53	83.47
BDU	NONE	150 Watts	6%	0 days	38.99	16.53	83.47
BDU	NONE	300 Watts	0%	12 days	37.96	.15	99.85
BDU	NONE	300 Watts	0%	8 days	38.02	.22	99.78
BDU	NONE	300 Watts	0%	4 days	38.22	.68	99.32
BDU	NONE	300 Watts	0%	0 days	38.88	11.78	88.22
BDU	NONE	300 Watts	2%	12 days	38.39	1.62	98.38
BDU	NONE	300 Watts	2%	8 days	38.50	2.77	97.23
BDU	NONE	300 Watts	2%	4 days	38.74	7.23	92.77
BDU	NONE	300 Watts	2%	0 days	39.23	30.20	69.80
BDU	NONE	300 Watts	4%	12 days	39.09	21.44	78.56
BDU	NONE	300 Watts	4%	8 days	39.21	29.14	70.86
BDU	NONE	300 Watts	4%	4 days	39.37	40.44	59.56
BDU	NONE	300 Watts	4%	0 days	39.58	55.92	44.08
BDU	NONE	300 Watts	6%	12 days	39.92	79.29	20.71
BDU	NONE	300 Watts	6%	8 days	39.92	79.29	20.71
BDU	NONE	300 Watts	6%	4 days	39.92	79.29	20.71
BDU	NONE	300 Watts	6%	0 days	39.92	79.29	20.71
BDU	NONE	400 Watts	0%	12 days	38.43	1.98	98.02
BDU	NONE	400 Watts	0%	8 days	38.50	2.69	97.31
BDU	NONE	400 Watts	0%	4 days	38.72	6.70	93.30
BDU	NONE	400 Watts	0%	0 days	39.49	49.05	50.95
BDU	NONE	400 Watts	2%	12 days	38.87	11.31	88.69
BDU	NONE	400 Watts	2%	8 days	39.00	16.80	83.20
BDU	NONE	400 Watts	2%	4 days	39.27	32.91	67.09
BDU	NONE	400 Watts	2%	0 days	39.83	74.01	25.99
BDU	NONE	400 Watts	4%	12 days	39.62	58.91	41.09
BDU	NONE	400 Watts	4%	8 days	39.76	69.31	30.69
BDU	NONE	400 Watts	4%	4 days	39.95	80.50	19.50
BDU	NONE	400 Watts	4%	0 days	40.18	90.51	9.49
BDU	NONE	400 Watts	6%	12 days	40.53	97.61	2.39
BDU	NONE	400 Watts	6%	8 days	40.53	97.61	2.39
BDU	NONE	400 Watts	6%	4 days	40.53	97.61	2.39
BDU	NONE	400 Watts	6%	0 days	40.53	97.61	2.39

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	NONE	500 Watts	0%	12 days	38.97	15.43	84.57
BDU	NONE	500 Watts	0%	8 days	39.05	19.15	80.85
BDU	NONE	500 Watts	0%	4 days	39.30	34.89	65.11
BDU	NONE	500 Watts	0%	0 days	40.13	88.86	11.14
BDU	NONE	500 Watts	2%	12 days	39.42	44.11	55.89
BDU	NONE	500 Watts	2%	8 days	39.57	55.23	44.77
BDU	NONE	500 Watts	2%	4 days	39.87	75.99	24.01
BDU	NONE	500 Watts	2%	0 days	40.48	97.04	2.96
BDU	NONE	500 Watts	4%	12 days	40.21	91.52	8.48
BDU	NONE	500 Watts	4%	8 days	40.37	95.33	4.67
BDU	NONE	500 Watts	4%	4 days	40.57	98.05	1.95
BDU	NONE	500 Watts	4%	0 days	40.83	99.47	.53
BDU	NONE	500 Watts	6%	12 days	41.17	99.94	.06
BDU	NONE	500 Watts	6%	8 days	41.17	99.94	.06
BDU	NONE	500 Watts	6%	4 days	41.17	99.94	.06
BDU	NONE	500 Watts	6%	0 days	41.17	99.94	.06
BDU	NONE	600 Watts	0%	12 days	39.58	55.83	44.17
BDU	NONE	600 Watts	0%	8 days	39.66	62.04	37.96
BDU	NONE	600 Watts	0%	4 days	39.94	79.88	20.12
BDU	NONE	600 Watts	0%	0 days	40.85	99.53	.47
BDU	NONE	600 Watts	2%	12 days	40.04	84.99	15.01
BDU	NONE	600 Watts	2%	8 days	40.20	91.03	8.97
BDU	NONE	600 Watts	2%	4 days	40.53	97.57	2.43
BDU	NONE	600 Watts	2%	0 days	41.20	99.95	.05
BDU	NONE	600 Watts	4%	12 days	40.87	99.59	.41
BDU	NONE	600 Watts	4%	8 days	41.05	99.85	.15
BDU	NONE	600 Watts	4%	4 days	41.27	99.97	.03
BDU	NONE	600 Watts	4%	0 days	41.55	100.00	0.00
BDU	NONE	600 Watts	6%	12 days	41.89	100.00	0.00
BDU	NONE	600 Watts	6%	8 days	41.89	100.00	0.00
BDU	NONE	600 Watts	6%	4 days	41.89	100.00	0.00
BDU	NONE	600 Watts	6%	0 days	41.89	100.00	0.00
BDU	FM 21-10	105 Watts	0%	12 days	37.10	0.00	100.00
BDU	FM 21-10	105 Watts	0%	8 days	37.14	0.00	100.00
BDU	FM 21-10	105 Watts	0%	4 days	37.26	0.00	100.00
BDU	FM 21-10	105 Watts	0%	0 days	37.66	.02	99.98
BDU	FM 21-10	105 Watts	2%	12 days	37.50	.01	99.99
BDU	FM 21-10	105 Watts	2%	8 days	37.57	.01	99.99
BDU	FM 21-10	105 Watts	2%	4 days	37.71	.03	99.97
BDU	FM 21-10	105 Watts	2%	0 days	38.01	.21	99.79
BDU	FM 21-10	105 Watts	4%	12 days	38.06	.28	99.72
BDU	FM 21-10	105 Watts	4%	8 days	38.14	.44	99.56
BDU	FM 21-10	105 Watts	4%	4 days	38.23	.74	99.26
BDU	FM 21-10	105 Watts	4%	0 days	38.36	1.39	98.61
BDU	FM 21-10	105 Watts	6%	12 days	38.70	6.28	93.72
BDU	FM 21-10	105 Watts	6%	8 days	38.70	6.28	93.72
BDU	FM 21-10	105 Watts	6%	4 days	38.70	6.28	93.72
BDU	FM 21-10	105 Watts	6%	0 days	38.70	6.28	93.72
BDU	FM 21-10	150 Watts	0%	12 days	37.26	0.00	75.00
BDU	FM 21-10	150 Watts	0%	8 days	37.30	0.00	75.00
BDU	FM 21-10	150 Watts	0%	4 days	37.44	0.00	75.00
BDU	FM 21-10	150 Watts	0%	0 days	37.90	.10	74.93
BDU	FM 21-10	150 Watts	2%	12 days	37.66	.02	74.99
BDU	FM 21-10	150 Watts	2%	8 days	37.74	.04	74.97
BDU	FM 21-10	150 Watts	2%	4 days	37.91	.11	74.92
BDU	FM 21-10	150 Watts	2%	0 days	38.24	.78	74.42
BDU	FM 21-10	150 Watts	4%	12 days	38.25	.83	74.38
BDU	FM 21-10	150 Watts	4%	8 days	38.34	1.29	74.03
BDU	FM 21-10	150 Watts	4%	4 days	38.45	2.18	73.36
BDU	FM 21-10	150 Watts	4%	0 days	38.59	4.01	71.99
BDU	FM 21-10	150 Watts	6%	12 days	38.94	13.97	64.52
BDU	FM 21-10	150 Watts	6%	8 days	38.94	13.97	64.52
BDU	FM 21-10	150 Watts	6%	4 days	38.94	13.97	64.52
BDU	FM 21-10	150 Watts	6%	0 days	38.94	13.97	64.52

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	FM 21-10	300 Watts	0%	12 days	37.84	.07	74.95
BDU	FM 21-10	300 Watts	0%	8 days	37.90	.10	74.93
BDU	FM 21-10	300 Watts	0%	4 days	38.09	.34	74.75
BDU	FM 21-10	300 Watts	0%	0 days	38.73	7.00	69.75
BDU	FM 21-10	300 Watts	2%	12 days	38.27	.88	74.34
BDU	FM 21-10	300 Watts	2%	8 days	38.38	1.56	73.83
BDU	FM 21-10	300 Watts	2%	4 days	38.62	4.43	71.68
BDU	FM 21-10	300 Watts	2%	0 days	39.08	20.95	59.29
BDU	FM 21-10	300 Watts	4%	12 days	38.96	15.03	63.73
BDU	FM 21-10	300 Watts	4%	8 days	39.08	21.05	59.21
BDU	FM 21-10	300 Watts	4%	4 days	39.23	30.42	52.19
BDU	FM 21-10	300 Watts	4%	0 days	39.43	44.42	41.69
BDU	FM 21-10	300 Watts	6%	12 days	39.77	70.10	22.43
BDU	FM 21-10	300 Watts	6%	8 days	39.77	70.10	22.43
BDU	FM 21-10	300 Watts	6%	4 days	39.77	70.10	22.43
BDU	FM 21-10	300 Watts	6%	0 days	39.77	70.10	22.43
BDU	FM 21-10	400 Watts	0%	12 days	38.25	.79	74.41
BDU	FM 21-10	400 Watts	0%	8 days	38.31	1.12	74.16
BDU	FM 21-10	400 Watts	0%	4 days	38.54	3.24	72.57
BDU	FM 21-10	400 Watts	0%	0 days	39.29	34.19	49.36
BDU	FM 21-10	400 Watts	2%	12 days	38.68	5.84	70.62
BDU	FM 21-10	400 Watts	2%	8 days	38.82	9.45	67.91
BDU	FM 21-10	400 Watts	2%	4 days	39.09	21.56	58.83
BDU	FM 21-10	400 Watts	2%	0 days	39.64	60.26	29.81
BDU	FM 21-10	400 Watts	4%	12 days	39.44	45.23	41.08
BDU	FM 21-10	400 Watts	4%	8 days	39.58	56.36	32.73
BDU	FM 21-10	400 Watts	4%	4 days	39.76	69.14	23.15
BDU	FM 21-10	400 Watts	4%	0 days	39.98	82.32	13.26
BDU	FM 21-10	400 Watts	6%	12 days	40.33	94.47	4.15
BDU	FM 21-10	400 Watts	6%	8 days	40.33	94.47	4.15
BDU	FM 21-10	400 Watts	6%	4 days	40.33	94.47	4.15
BDU	FM 21-10	400 Watts	6%	0 days	40.33	94.47	4.15
BDU	FM 21-10	500 Watts	0%	12 days	38.71	6.41	70.19
BDU	FM 21-10	500 Watts	0%	8 days	38.78	8.43	68.68
BDU	FM 21-10	500 Watts	0%	4 days	39.04	18.59	61.06
BDU	FM 21-10	500 Watts	0%	0 days	39.87	76.15	17.89
BDU	FM 21-10	500 Watts	2%	12 days	39.16	25.70	55.73
BDU	FM 21-10	500 Watts	2%	8 days	39.31	35.43	48.43
BDU	FM 21-10	500 Watts	2%	4 days	39.61	58.09	31.43
BDU	FM 21-10	500 Watts	2%	0 days	40.22	91.60	6.30
BDU	FM 21-10	500 Watts	4%	12 days	39.95	80.83	14.38
BDU	FM 21-10	500 Watts	4%	8 days	40.11	88.09	8.93
BDU	FM 21-10	500 Watts	4%	4 days	40.32	94.22	4.34
BDU	FM 21-10	500 Watts	4%	0 days	40.56	97.96	1.53
BDU	FM 21-10	500 Watts	6%	12 days	40.91	99.67	.25
BDU	FM 21-10	500 Watts	6%	8 days	40.91	99.67	.25
BDU	FM 21-10	500 Watts	6%	4 days	40.91	99.67	.25
BDU	FM 21-10	500 Watts	6%	0 days	40.91	99.67	.25
BDU	FM 21-10	600 Watts	0%	12 days	39.22	29.72	52.71
BDU	FM 21-10	600 Watts	0%	8 days	39.31	35.50	48.38
BDU	FM 21-10	600 Watts	0%	4 days	39.59	56.55	32.59
BDU	FM 21-10	600 Watts	0%	0 days	40.53	97.66	1.76
BDU	FM 21-10	600 Watts	2%	12 days	39.69	63.99	27.01
BDU	FM 21-10	600 Watts	2%	8 days	39.85	74.79	18.91
BDU	FM 21-10	600 Watts	2%	4 days	40.18	90.50	7.13
BDU	FM 21-10	600 Watts	2%	0 days	40.88	99.60	.30
BDU	FM 21-10	600 Watts	4%	12 days	40.53	97.61	1.79
BDU	FM 21-10	600 Watts	4%	8 days	40.71	98.99	.76
BDU	FM 21-10	600 Watts	4%	4 days	40.93	99.71	.22
BDU	FM 21-10	600 Watts	4%	0 days	41.23	99.96	.03
BDU	FM 21-10	600 Watts	6%	12 days	41.57	100.00	0.00
BDU	FM 21-10	600 Watts	6%	8 days	41.57	100.00	0.00
BDU	FM 21-10	600 Watts	6%	4 days	41.57	100.00	0.00
BDU	FM 21-10	600 Watts	6%	0 days	41.57	100.00	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	MET LIMIT 39oC	105 Watts	0%	12 days	37.10	0.00	100.00
BDU	MET LIMIT 39oC	105 Watts	0%	8 days	37.14	0.00	100.00
BDU	MET LIMIT 39oC	105 Watts	0%	4 days	37.26	0.00	100.00
BDU	MET LIMIT 39oC	105 Watts	0%	0 days	37.66	.02	99.98
BDU	MET LIMIT 39oC	105 Watts	2%	12 days	37.50	.01	99.99
BDU	MET LIMIT 39oC	105 Watts	2%	8 days	37.57	.01	99.99
BDU	MET LIMIT 39oC	105 Watts	2%	4 days	37.71	.03	99.97
BDU	MET LIMIT 39oC	105 Watts	2%	0 days	38.01	.21	99.79
BDU	MET LIMIT 39oC	105 Watts	4%	12 days	38.06	.28	99.72
BDU	MET LIMIT 39oC	105 Watts	4%	8 days	38.14	.44	99.56
BDU	MET LIMIT 39oC	105 Watts	4%	4 days	38.23	.74	99.26
BDU	MET LIMIT 39oC	105 Watts	4%	0 days	38.36	1.39	98.61
BDU	MET LIMIT 39oC	105 Watts	6%	12 days	38.70	6.28	93.72
BDU	MET LIMIT 39oC	105 Watts	6%	8 days	38.70	6.28	93.72
BDU	MET LIMIT 39oC	105 Watts	6%	4 days	38.70	6.28	93.72
BDU	MET LIMIT 39oC	105 Watts	6%	0 days	38.70	6.28	93.72
BDU	MET LIMIT 39oC	150 Watts	0%	12 days	37.30	0.00	100.00
BDU	MET LIMIT 39oC	150 Watts	0%	8 days	37.34	0.00	100.00
BDU	MET LIMIT 39oC	150 Watts	0%	4 days	37.48	.01	99.99
BDU	MET LIMIT 39oC	150 Watts	0%	0 days	37.95	.15	99.85
BDU	MET LIMIT 39oC	150 Watts	2%	12 days	37.70	.03	99.97
BDU	MET LIMIT 39oC	150 Watts	2%	8 days	37.79	.05	99.95
BDU	MET LIMIT 39oC	150 Watts	2%	4 days	37.95	.15	99.85
BDU	MET LIMIT 39oC	150 Watts	2%	0 days	38.30	1.05	98.95
BDU	MET LIMIT 39oC	150 Watts	4%	12 days	38.30	1.05	98.95
BDU	MET LIMIT 39oC	150 Watts	4%	8 days	38.39	1.64	98.36
BDU	MET LIMIT 39oC	150 Watts	4%	4 days	38.50	2.76	97.24
BDU	MET LIMIT 39oC	150 Watts	4%	0 days	38.65	5.05	94.95
BDU	MET LIMIT 39oC	150 Watts	6%	12 days	38.99	16.53	83.47
BDU	MET LIMIT 39oC	150 Watts	6%	8 days	38.99	16.53	83.47
BDU	MET LIMIT 39oC	150 Watts	6%	4 days	38.99	16.53	83.47
BDU	MET LIMIT 39oC	150 Watts	6%	0 days	38.99	16.53	83.47
BDU	MET LIMIT 39oC	300 Watts	0%	12 days	37.96	.15	99.85
BDU	MET LIMIT 39oC	300 Watts	0%	8 days	38.02	.22	99.78
BDU	MET LIMIT 39oC	300 Watts	0%	4 days	38.22	.68	99.32
BDU	MET LIMIT 39oC	300 Watts	0%	0 days	38.88	11.78	88.22
BDU	MET LIMIT 39oC	300 Watts	2%	12 days	38.39	1.62	98.38
BDU	MET LIMIT 39oC	300 Watts	2%	8 days	38.50	2.77	97.23
BDU	MET LIMIT 39oC	300 Watts	2%	4 days	38.74	7.23	92.77
BDU	MET LIMIT 39oC	300 Watts	2%	0 days	39.04	18.98	72.11
BDU	MET LIMIT 39oC	300 Watts	4%	12 days	39.00	16.79	80.71
BDU	MET LIMIT 39oC	300 Watts	4%	8 days	39.05	19.14	71.16
BDU	MET LIMIT 39oC	300 Watts	4%	4 days	39.05	19.16	60.63
BDU	MET LIMIT 39oC	300 Watts	4%	0 days	39.05	19.18	49.30
BDU	MET LIMIT 39oC	300 Watts	6%	12 days	39.05	19.09	27.51
BDU	MET LIMIT 39oC	300 Watts	6%	8 days	39.05	19.09	27.51
BDU	MET LIMIT 39oC	300 Watts	6%	4 days	39.05	19.09	27.51
BDU	MET LIMIT 39oC	300 Watts	6%	0 days	39.05	19.09	27.51
BDU	MET LIMIT 39oC	400 Watts	0%	12 days	38.43	1.98	98.02
BDU	MET LIMIT 39oC	400 Watts	0%	8 days	38.50	2.69	97.31
BDU	MET LIMIT 39oC	400 Watts	0%	4 days	38.72	6.70	93.30
BDU	MET LIMIT 39oC	400 Watts	0%	0 days	39.05	19.25	62.99
BDU	MET LIMIT 39oC	400 Watts	2%	12 days	38.87	11.31	88.69
BDU	MET LIMIT 39oC	400 Watts	2%	8 days	39.00	16.80	83.20
BDU	MET LIMIT 39oC	400 Watts	2%	4 days	39.04	18.86	70.59
BDU	MET LIMIT 39oC	400 Watts	2%	0 days	39.04	18.98	47.80
BDU	MET LIMIT 39oC	400 Watts	4%	12 days	39.04	18.88	52.73
BDU	MET LIMIT 39oC	400 Watts	4%	8 days	39.05	19.14	46.90
BDU	MET LIMIT 39oC	400 Watts	4%	4 days	39.05	19.16	40.42
BDU	MET LIMIT 39oC	400 Watts	4%	0 days	39.05	19.18	33.14
BDU	MET LIMIT 39oC	400 Watts	6%	12 days	39.05	19.09	17.80
BDU	MET LIMIT 39oC	400 Watts	6%	8 days	39.05	19.09	17.80
BDU	MET LIMIT 39oC	400 Watts	6%	4 days	39.05	19.09	17.80
BDU	MET LIMIT 39oC	400 Watts	6%	0 days	39.05	19.09	17.80

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	MET LIMIT 39oC	105 Watts	0%	12 days	37.10	0.00	100.00
BDU	MET LIMIT 39oC	105 Watts	0%	8 days	37.14	0.00	100.00
BDU	MET LIMIT 39oC	105 Watts	0%	4 days	37.26	0.00	100.00
BDU	MET LIMIT 39oC	105 Watts	0%	0 days	37.66	.02	99.98
BDU	MET LIMIT 39oC	105 Watts	2%	12 days	37.50	.01	99.99
BDU	MET LIMIT 39oC	105 Watts	2%	8 days	37.57	.01	99.99
BDU	MET LIMIT 39oC	105 Watts	2%	4 days	37.71	.03	99.97
BDU	MET LIMIT 39oC	105 Watts	2%	0 days	38.01	.21	99.79
BDU	MET LIMIT 39oC	105 Watts	4%	12 days	38.06	.28	99.72
BDU	MET LIMIT 39oC	105 Watts	4%	8 days	38.14	.44	99.56
BDU	MET LIMIT 39oC	105 Watts	4%	4 days	38.23	.74	99.26
BDU	MET LIMIT 39oC	105 Watts	4%	0 days	38.36	1.39	98.61
BDU	MET LIMIT 39oC	105 Watts	6%	12 days	38.70	6.28	93.72
BDU	MET LIMIT 39oC	105 Watts	6%	8 days	38.70	6.28	93.72
BDU	MET LIMIT 39oC	105 Watts	6%	4 days	38.70	6.28	93.72
BDU	MET LIMIT 39oC	105 Watts	6%	0 days	38.70	6.28	93.72
BDU	MET LIMIT 39oC	150 Watts	0%	12 days	37.30	0.00	100.00
BDU	MET LIMIT 39oC	150 Watts	0%	8 days	37.34	0.00	100.00
BDU	MET LIMIT 39oC	150 Watts	0%	4 days	37.48	.01	99.99
BDU	MET LIMIT 39oC	150 Watts	0%	0 days	37.95	.15	99.85
BDU	MET LIMIT 39oC	150 Watts	2%	12 days	37.70	.03	99.97
BDU	MET LIMIT 39oC	150 Watts	2%	8 days	37.79	.05	99.95
BDU	MET LIMIT 39oC	150 Watts	2%	4 days	37.95	.15	99.85
BDU	MET LIMIT 39oC	150 Watts	2%	0 days	38.30	1.05	98.95
BDU	MET LIMIT 39oC	150 Watts	4%	12 days	38.30	1.05	98.95
BDU	MET LIMIT 39oC	150 Watts	4%	8 days	38.39	1.64	98.36
BDU	MET LIMIT 39oC	150 Watts	4%	4 days	38.50	2.76	97.24
BDU	MET LIMIT 39oC	150 Watts	4%	0 days	38.65	5.05	94.95
BDU	MET LIMIT 39oC	150 Watts	6%	12 days	38.99	16.53	83.47
BDU	MET LIMIT 39oC	150 Watts	6%	8 days	38.99	16.53	83.47
BDU	MET LIMIT 39oC	150 Watts	6%	4 days	38.99	16.53	83.47
BDU	MET LIMIT 39oC	150 Watts	6%	0 days	38.99	16.53	83.47
BDU	MET LIMIT 39oC	300 Watts	0%	12 days	37.96	.15	99.85
BDU	MET LIMIT 39oC	300 Watts	0%	8 days	38.02	.22	99.78
BDU	MET LIMIT 39oC	300 Watts	0%	4 days	38.22	.68	99.32
BDU	MET LIMIT 39oC	300 Watts	0%	0 days	38.88	11.78	88.22
BDU	MET LIMIT 39oC	300 Watts	2%	12 days	38.39	1.62	98.38
BDU	MET LIMIT 39oC	300 Watts	2%	8 days	38.50	2.77	97.23
BDU	MET LIMIT 39oC	300 Watts	2%	4 days	38.74	7.23	92.77
BDU	MET LIMIT 39oC	300 Watts	2%	0 days	39.04	18.98	72.11
BDU	MET LIMIT 39oC	300 Watts	4%	12 days	39.00	16.79	80.71
BDU	MET LIMIT 39oC	300 Watts	4%	8 days	39.05	19.14	71.16
BDU	MET LIMIT 39oC	300 Watts	4%	4 days	39.05	19.16	60.63
BDU	MET LIMIT 39oC	300 Watts	4%	0 days	39.05	19.18	49.30
BDU	MET LIMIT 39oC	300 Watts	6%	12 days	39.05	19.09	27.51
BDU	MET LIMIT 39oC	300 Watts	6%	8 days	39.05	19.09	27.51
BDU	MET LIMIT 39oC	300 Watts	6%	4 days	39.05	19.09	27.51
BDU	MET LIMIT 39oC	300 Watts	6%	0 days	39.05	19.09	27.51
BDU	MET LIMIT 39oC	400 Watts	0%	12 days	38.43	1.98	98.02
BDU	MET LIMIT 39oC	400 Watts	0%	8 days	38.50	2.69	97.31
BDU	MET LIMIT 39oC	400 Watts	0%	4 days	38.72	6.70	93.30
BDU	MET LIMIT 39oC	400 Watts	0%	0 days	39.05	19.25	62.99
BDU	MET LIMIT 39oC	400 Watts	2%	12 days	38.87	11.31	88.69
BDU	MET LIMIT 39oC	400 Watts	2%	8 days	39.00	16.80	83.20
BDU	MET LIMIT 39oC	400 Watts	2%	4 days	39.04	18.86	70.59
BDU	MET LIMIT 39oC	400 Watts	2%	0 days	39.04	18.98	47.80
BDU	MET LIMIT 39oC	400 Watts	4%	12 days	39.04	18.88	52.73
BDU	MET LIMIT 39oC	400 Watts	4%	8 days	39.05	19.14	46.90
BDU	MET LIMIT 39oC	400 Watts	4%	4 days	39.05	19.16	40.42
BDU	MET LIMIT 39oC	400 Watts	4%	0 days	39.05	19.18	33.14
BDU	MET LIMIT 39oC	400 Watts	6%	12 days	39.05	19.09	17.80
BDU	MET LIMIT 39oC	400 Watts	6%	8 days	39.05	19.09	17.80
BDU	MET LIMIT 39oC	400 Watts	6%	4 days	39.05	19.09	17.80
BDU	MET LIMIT 39oC	400 Watts	6%	0 days	39.05	19.09	17.80

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	MET LIMIT 39oC	500 Watts	0%	12 days	38.97	15.43	84.57
BDU	MET LIMIT 39oC	500 Watts	0%	8 days	39.00	16.92	83.08
BDU	MET LIMIT 39oC	500 Watts	0%	4 days	39.05	19.07	73.65
BDU	MET LIMIT 39oC	500 Watts	0%	0 days	39.05	19.25	46.84
BDU	MET LIMIT 39oC	500 Watts	2%	12 days	39.04	18.59	68.38
BDU	MET LIMIT 39oC	500 Watts	2%	8 days	39.04	19.02	63.16
BDU	MET LIMIT 39oC	500 Watts	2%	4 days	39.04	18.86	52.74
BDU	MET LIMIT 39oC	500 Watts	2%	0 days	39.04	18.98	35.65
BDU	MET LIMIT 39oC	500 Watts	4%	12 days	39.04	18.88	39.75
BDU	MET LIMIT 39oC	500 Watts	4%	8 days	39.05	19.14	35.58
BDU	MET LIMIT 39oC	500 Watts	4%	4 days	39.05	19.16	29.91
BDU	MET LIMIT 39oC	500 Watts	4%	0 days	39.05	19.18	24.25
BDU	MET LIMIT 39oC	500 Watts	6%	12 days	39.05	19.09	13.75
BDU	MET LIMIT 39oC	500 Watts	6%	8 days	39.05	19.09	13.75
BDU	MET LIMIT 39oC	500 Watts	6%	4 days	39.05	19.09	13.75
BDU	MET LIMIT 39oC	500 Watts	6%	0 days	39.05	19.09	13.75
BDU	MET LIMIT 39oC	600 Watts	0%	12 days	38.97	15.43	71.88
BDU	MET LIMIT 39oC	600 Watts	0%	8 days	39.00	16.92	68.13
BDU	MET LIMIT 39oC	600 Watts	0%	4 days	39.05	19.07	58.27
BDU	MET LIMIT 39oC	600 Watts	0%	0 days	39.05	19.25	37.95
BDU	MET LIMIT 39oC	600 Watts	2%	12 days	39.04	18.59	54.54
BDU	MET LIMIT 39oC	600 Watts	2%	8 days	39.04	19.02	50.21
BDU	MET LIMIT 39oC	600 Watts	2%	4 days	39.04	18.86	42.19
BDU	MET LIMIT 39oC	600 Watts	2%	0 days	39.04	18.98	28.36
BDU	MET LIMIT 39oC	600 Watts	4%	12 days	39.04	18.88	31.64
BDU	MET LIMIT 39oC	600 Watts	4%	8 days	39.05	19.14	28.30
BDU	MET LIMIT 39oC	600 Watts	4%	4 days	39.05	19.16	24.25
BDU	MET LIMIT 39oC	600 Watts	4%	0 days	39.05	19.18	19.40
BDU	MET LIMIT 39oC	600 Watts	6%	12 days	39.05	19.09	10.52
BDU	MET LIMIT 39oC	600 Watts	6%	8 days	39.05	19.09	10.52
BDU	MET LIMIT 39oC	600 Watts	6%	4 days	39.05	19.09	10.52
BDU	MET LIMIT 39oC	600 Watts	6%	0 days	39.05	19.09	10.52
BDU	MET LIMIT 38.5oC	105 Watts	0%	12 days	37.10	0.00	100.00
BDU	MET LIMIT 38.5oC	105 Watts	0%	8 days	37.14	0.00	100.00
BDU	MET LIMIT 38.5oC	105 Watts	0%	4 days	37.26	0.00	100.00
BDU	MET LIMIT 38.5oC	105 Watts	0%	0 days	37.66	.02	99.98
BDU	MET LIMIT 38.5oC	105 Watts	2%	12 days	37.50	.01	99.99
BDU	MET LIMIT 38.5oC	105 Watts	2%	8 days	37.57	.01	99.99
BDU	MET LIMIT 38.5oC	105 Watts	2%	4 days	37.71	.03	99.97
BDU	MET LIMIT 38.5oC	105 Watts	2%	0 days	38.01	.21	99.79
BDU	MET LIMIT 38.5oC	105 Watts	4%	12 days	38.06	.28	99.72
BDU	MET LIMIT 38.5oC	105 Watts	4%	8 days	38.14	.44	99.56
BDU	MET LIMIT 38.5oC	105 Watts	4%	4 days	38.23	.74	99.26
BDU	MET LIMIT 38.5oC	105 Watts	4%	0 days	38.36	1.39	98.61
BDU	MET LIMIT 38.5oC	105 Watts	6%	12 days	38.70	6.28	93.72
BDU	MET LIMIT 38.5oC	105 Watts	6%	8 days	38.70	6.28	93.72
BDU	MET LIMIT 38.5oC	105 Watts	6%	4 days	38.70	6.28	93.72
BDU	MET LIMIT 38.5oC	105 Watts	6%	0 days	38.70	6.28	93.72
BDU	MET LIMIT 38.5oC	150 Watts	0%	12 days	37.30	0.00	100.00
BDU	MET LIMIT 38.5oC	150 Watts	0%	8 days	37.34	0.00	100.00
BDU	MET LIMIT 38.5oC	150 Watts	0%	4 days	37.48	.01	99.99
BDU	MET LIMIT 38.5oC	150 Watts	0%	0 days	37.95	.15	99.85
BDU	MET LIMIT 38.5oC	150 Watts	2%	12 days	37.70	.02	99.98
BDU	MET LIMIT 38.5oC	150 Watts	2%	8 days	37.79	.05	99.95
BDU	MET LIMIT 38.5oC	150 Watts	2%	4 days	37.95	.15	99.85
BDU	MET LIMIT 38.5oC	150 Watts	2%	0 days	38.30	1.05	98.95
BDU	MET LIMIT 38.5oC	150 Watts	4%	12 days	38.30	1.05	98.95
BDU	MET LIMIT 38.5oC	150 Watts	4%	8 days	38.39	1.64	98.36
BDU	MET LIMIT 38.5oC	150 Watts	4%	4 days	38.50	2.71	97.29
BDU	MET LIMIT 38.5oC	150 Watts	4%	0 days	38.50	2.74	81.70
BDU	MET LIMIT 38.5oC	150 Watts	6%	12 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	150 Watts	6%	8 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	150 Watts	6%	4 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	150 Watts	6%	0 days	38.70	6.28	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	MET LIMIT 38.5oC	300 Watts	0%	12 days	37.96	.15	99.85
BDU	MET LIMIT 38.5oC	300 Watts	0%	8 days	38.02	.22	99.78
BDU	MET LIMIT 38.5oC	300 Watts	0%	4 days	38.22	.68	99.32
BDU	MET LIMIT 38.5oC	300 Watts	0%	0 days	38.54	3.18	74.55
BDU	MET LIMIT 38.5oC	300 Watts	2%	12 days	38.39	1.62	98.38
BDU	MET LIMIT 38.5oC	300 Watts	2%	8 days	38.50	2.77	97.23
BDU	MET LIMIT 38.5oC	300 Watts	2%	4 days	38.53	3.15	82.32
BDU	MET LIMIT 38.5oC	300 Watts	2%	0 days	38.54	3.21	47.43
BDU	MET LIMIT 38.5oC	300 Watts	4%	12 days	38.53	3.13	43.59
BDU	MET LIMIT 38.5oC	300 Watts	4%	8 days	38.53	3.13	40.69
BDU	MET LIMIT 38.5oC	300 Watts	4%	4 days	38.53	3.14	31.00
BDU	MET LIMIT 38.5oC	300 Watts	4%	0 days	38.53	3.15	20.34
BDU	MET LIMIT 38.5oC	300 Watts	6%	12 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	300 Watts	6%	8 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	300 Watts	6%	4 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	300 Watts	6%	0 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	400 Watts	0%	12 days	38.43	1.98	98.02
BDU	MET LIMIT 38.5oC	400 Watts	0%	8 days	38.50	2.69	97.31
BDU	MET LIMIT 38.5oC	400 Watts	0%	4 days	38.53	3.15	86.20
BDU	MET LIMIT 38.5oC	400 Watts	0%	0 days	38.54	3.18	49.38
BDU	MET LIMIT 38.5oC	400 Watts	2%	12 days	38.53	3.11	75.57
BDU	MET LIMIT 38.5oC	400 Watts	2%	8 days	38.53	3.14	67.80
BDU	MET LIMIT 38.5oC	400 Watts	2%	4 days	38.53	3.15	54.24
BDU	MET LIMIT 38.5oC	400 Watts	2%	0 days	38.54	3.21	31.94
BDU	MET LIMIT 38.5oC	400 Watts	4%	12 days	38.53	3.13	29.06
BDU	MET LIMIT 38.5oC	400 Watts	4%	8 days	38.53	3.13	27.12
BDU	MET LIMIT 38.5oC	400 Watts	4%	4 days	38.53	3.14	20.34
BDU	MET LIMIT 38.5oC	400 Watts	4%	0 days	38.53	3.15	13.56
BDU	MET LIMIT 38.5oC	400 Watts	6%	12 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	400 Watts	6%	8 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	400 Watts	6%	4 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	400 Watts	6%	0 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	500 Watts	0%	12 days	38.53	3.13	78.46
BDU	MET LIMIT 38.5oC	500 Watts	0%	8 days	38.53	3.15	75.54
BDU	MET LIMIT 38.5oC	500 Watts	0%	4 days	38.53	3.15	64.89
BDU	MET LIMIT 38.5oC	500 Watts	0%	0 days	38.54	3.18	36.79
BDU	MET LIMIT 38.5oC	500 Watts	2%	12 days	38.53	3.11	57.17
BDU	MET LIMIT 38.5oC	500 Watts	2%	8 days	38.53	3.14	51.34
BDU	MET LIMIT 38.5oC	500 Watts	2%	4 days	38.53	3.15	40.68
BDU	MET LIMIT 38.5oC	500 Watts	2%	0 days	38.54	3.21	23.23
BDU	MET LIMIT 38.5oC	500 Watts	4%	12 days	38.53	3.13	21.31
BDU	MET LIMIT 38.5oC	500 Watts	4%	8 days	38.53	3.13	20.34
BDU	MET LIMIT 38.5oC	500 Watts	4%	4 days	38.53	3.14	15.50
BDU	MET LIMIT 38.5oC	500 Watts	4%	0 days	38.53	3.15	10.65
BDU	MET LIMIT 38.5oC	500 Watts	6%	12 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	500 Watts	6%	8 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	500 Watts	6%	4 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	500 Watts	6%	0 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	600 Watts	0%	12 days	38.53	3.13	62.97
BDU	MET LIMIT 38.5oC	600 Watts	0%	8 days	38.53	3.15	60.05
BDU	MET LIMIT 38.5oC	600 Watts	0%	4 days	38.53	3.15	51.33
BDU	MET LIMIT 38.5oC	600 Watts	0%	0 days	38.54	3.18	29.05
BDU	MET LIMIT 38.5oC	600 Watts	2%	12 days	38.53	3.11	45.54
BDU	MET LIMIT 38.5oC	600 Watts	2%	8 days	38.53	3.14	40.68
BDU	MET LIMIT 38.5oC	600 Watts	2%	4 days	38.53	3.15	31.96
BDU	MET LIMIT 38.5oC	600 Watts	2%	0 days	38.54	3.21	18.39
BDU	MET LIMIT 38.5oC	600 Watts	4%	12 days	38.53	3.13	17.44
BDU	MET LIMIT 38.5oC	600 Watts	4%	8 days	38.53	3.13	16.47
BDU	MET LIMIT 38.5oC	600 Watts	4%	4 days	38.53	3.14	12.59
BDU	MET LIMIT 38.5oC	600 Watts	4%	0 days	38.53	3.15	7.75
BDU	MET LIMIT 38.5oC	600 Watts	6%	12 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	600 Watts	6%	8 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	600 Watts	6%	4 days	38.70	6.28	0.00
BDU	MET LIMIT 38.5oC	600 Watts	6%	0 days	38.70	6.28	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	MET LIMIT 38oC	105 Watts	0%	12 days	37.10	0.00	100.00
BDU	MET LIMIT 38oC	105 Watts	0%	8 days	37.14	0.00	100.00
BDU	MET LIMIT 38oC	105 Watts	0%	4 days	37.26	0.00	100.00
BDU	MET LIMIT 38oC	105 Watts	0%	0 days	37.66	.02	99.98
BDU	MET LIMIT 38oC	105 Watts	2%	12 days	37.50	.01	99.99
BDU	MET LIMIT 38oC	105 Watts	2%	8 days	37.57	.01	99.99
BDU	MET LIMIT 38oC	105 Watts	2%	4 days	37.71	.03	99.97
BDU	MET LIMIT 38oC	105 Watts	2%	0 days	38.01	.21	99.79
BDU	MET LIMIT 38oC	105 Watts	4%	12 days	38.06	.28	99.72
BDU	MET LIMIT 38oC	105 Watts	4%	8 days	38.14	.44	99.56
BDU	MET LIMIT 38oC	105 Watts	4%	4 days	38.23	.74	99.26
BDU	MET LIMIT 38oC	105 Watts	4%	0 days	38.36	1.39	98.61
BDU	MET LIMIT 38oC	105 Watts	6%	12 days	38.70	6.28	93.72
BDU	MET LIMIT 38oC	105 Watts	6%	8 days	38.70	6.28	93.72
BDU	MET LIMIT 38oC	105 Watts	6%	4 days	38.70	6.28	93.72
BDU	MET LIMIT 38oC	105 Watts	6%	0 days	38.70	6.28	93.72
BDU	MET LIMIT 38oC	150 Watts	0%	12 days	37.30	0.00	100.00
BDU	MET LIMIT 38oC	150 Watts	0%	8 days	37.34	0.00	100.00
BDU	MET LIMIT 38oC	150 Watts	0%	4 days	37.48	.01	99.99
BDU	MET LIMIT 38oC	150 Watts	0%	0 days	37.95	.15	99.85
BDU	MET LIMIT 38oC	150 Watts	2%	12 days	37.70	.03	99.97
BDU	MET LIMIT 38oC	150 Watts	2%	8 days	37.79	.05	99.95
BDU	MET LIMIT 38oC	150 Watts	2%	4 days	37.95	.15	99.85
BDU	MET LIMIT 38oC	150 Watts	2%	0 days	38.02	.22	39.91
BDU	MET LIMIT 38oC	150 Watts	4%	12 days	38.03	.24	19.95
BDU	MET LIMIT 38oC	150 Watts	4%	8 days	38.14	.44	0.00
BDU	MET LIMIT 38oC	150 Watts	4%	4 days	38.23	.74	0.00
BDU	MET LIMIT 38oC	150 Watts	4%	0 days	38.36	1.39	0.00
BDU	MET LIMIT 38oC	150 Watts	6%	12 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	150 Watts	6%	8 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	150 Watts	6%	4 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	150 Watts	6%	0 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	300 Watts	0%	12 days	37.96	.15	99.85
BDU	MET LIMIT 38oC	300 Watts	0%	8 days	38.00	.20	99.80
BDU	MET LIMIT 38oC	300 Watts	0%	4 days	38.03	.23	84.80
BDU	MET LIMIT 38oC	300 Watts	0%	0 days	38.03	.23	36.91
BDU	MET LIMIT 38oC	300 Watts	2%	12 days	38.02	.22	63.86
BDU	MET LIMIT 38oC	300 Watts	2%	8 days	38.02	.22	53.88
BDU	MET LIMIT 38oC	300 Watts	2%	4 days	38.03	.23	36.91
BDU	MET LIMIT 38oC	300 Watts	2%	0 days	38.02	.22	8.98
BDU	MET LIMIT 38oC	300 Watts	4%	12 days	38.03	.24	4.99
BDU	MET LIMIT 38oC	300 Watts	4%	8 days	38.14	.44	0.00
BDU	MET LIMIT 38oC	300 Watts	4%	4 days	38.23	.74	0.00
BDU	MET LIMIT 38oC	300 Watts	4%	0 days	38.36	1.39	0.00
BDU	MET LIMIT 38oC	300 Watts	6%	12 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	300 Watts	6%	8 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	300 Watts	6%	4 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	300 Watts	6%	0 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	400 Watts	0%	12 days	38.02	.23	73.83
BDU	MET LIMIT 38oC	400 Watts	0%	8 days	38.02	.23	68.84
BDU	MET LIMIT 38oC	400 Watts	0%	4 days	38.03	.23	55.87
BDU	MET LIMIT 38oC	400 Watts	0%	0 days	38.03	.23	23.94
BDU	MET LIMIT 38oC	400 Watts	2%	12 days	38.02	.22	42.91
BDU	MET LIMIT 38oC	400 Watts	2%	8 days	38.02	.22	35.92
BDU	MET LIMIT 38oC	400 Watts	2%	4 days	38.03	.23	23.94
BDU	MET LIMIT 38oC	400 Watts	2%	0 days	38.02	.22	5.99
BDU	MET LIMIT 38oC	400 Watts	4%	12 days	38.03	.24	2.99
BDU	MET LIMIT 38oC	400 Watts	4%	8 days	38.14	.44	0.00
BDU	MET LIMIT 38oC	400 Watts	4%	4 days	38.23	.74	0.00
BDU	MET LIMIT 38oC	400 Watts	4%	0 days	38.36	1.39	0.00
BDU	MET LIMIT 38oC	400 Watts	6%	12 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	400 Watts	6%	8 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	400 Watts	6%	4 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	400 Watts	6%	0 days	38.70	6.28	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	MET LIMIT 38oC	500 Watts	0%	12 days	38.02	.23	54.87
BDU	MET LIMIT 38oC	500 Watts	0%	8 days	38.02	.23	51.88
BDU	MET LIMIT 38oC	500 Watts	0%	4 days	38.03	.23	41.90
BDU	MET LIMIT 38oC	500 Watts	0%	0 days	38.03	.23	17.96
BDU	MET LIMIT 38oC	500 Watts	2%	12 days	38.02	.22	31.93
BDU	MET LIMIT 38oC	500 Watts	2%	8 days	38.02	.22	26.94
BDU	MET LIMIT 38oC	500 Watts	2%	4 days	38.03	.23	17.96
BDU	MET LIMIT 38oC	500 Watts	2%	0 days	38.02	.22	4.99
BDU	MET LIMIT 38oC	500 Watts	4%	12 days	38.03	.24	2.00
BDU	MET LIMIT 38oC	500 Watts	4%	8 days	38.14	.44	0.00
BDU	MET LIMIT 38oC	500 Watts	4%	4 days	38.23	.74	0.00
BDU	MET LIMIT 38oC	500 Watts	4%	0 days	38.36	1.39	0.00
BDU	MET LIMIT 38oC	500 Watts	6%	12 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	500 Watts	6%	8 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	500 Watts	6%	4 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	500 Watts	6%	0 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	600 Watts	0%	12 days	38.02	.23	43.90
BDU	MET LIMIT 38oC	600 Watts	0%	8 days	38.02	.23	40.91
BDU	MET LIMIT 38oC	600 Watts	0%	4 days	38.03	.23	33.92
BDU	MET LIMIT 38oC	600 Watts	0%	0 days	38.03	.23	13.97
BDU	MET LIMIT 38oC	600 Watts	2%	12 days	38.02	.22	24.95
BDU	MET LIMIT 38oC	600 Watts	2%	8 days	38.02	.23	20.95
BDU	MET LIMIT 38oC	600 Watts	2%	4 days	38.03	.23	14.97
BDU	MET LIMIT 38oC	600 Watts	2%	0 days	38.01	.21	3.99
BDU	MET LIMIT 38oC	600 Watts	4%	12 days	38.06	.28	1.99
BDU	MET LIMIT 38oC	600 Watts	4%	8 days	38.14	.44	0.00
BDU	MET LIMIT 38oC	600 Watts	4%	4 days	38.23	.74	0.00
BDU	MET LIMIT 38oC	600 Watts	4%	0 days	38.36	1.39	0.00
BDU	MET LIMIT 38oC	600 Watts	6%	12 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	600 Watts	6%	8 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	600 Watts	6%	4 days	38.70	6.28	0.00
BDU	MET LIMIT 38oC	600 Watts	6%	0 days	38.70	6.28	0.00
BDU	FM 21-40	105 Watts	0%	12 days	37.10	0.00	100.00
BDU	FM 21-40	105 Watts	0%	8 days	37.14	0.00	100.00
BDU	FM 21-40	105 Watts	0%	4 days	37.26	0.00	100.00
BDU	FM 21-40	105 Watts	0%	0 days	37.66	.02	99.98
BDU	FM 21-40	105 Watts	2%	12 days	37.50	.01	99.99
BDU	FM 21-40	105 Watts	2%	8 days	37.57	.01	99.99
BDU	FM 21-40	105 Watts	2%	4 days	37.71	.03	99.97
BDU	FM 21-40	105 Watts	2%	0 days	38.01	.21	99.79
BDU	FM 21-40	105 Watts	4%	12 days	38.06	.28	99.72
BDU	FM 21-40	105 Watts	4%	8 days	38.14	.44	99.56
BDU	FM 21-40	105 Watts	4%	4 days	38.23	.74	99.26
BDU	FM 21-40	105 Watts	4%	0 days	38.36	1.39	98.61
BDU	FM 21-40	105 Watts	6%	12 days	38.70	6.28	93.72
BDU	FM 21-40	105 Watts	6%	8 days	38.70	6.28	93.72
BDU	FM 21-40	105 Watts	6%	4 days	38.70	6.28	93.72
BDU	FM 21-40	105 Watts	6%	0 days	38.70	6.28	93.72
BDU	FM 21-40	150 Watts	0%	12 days	37.30	0.00	100.00
BDU	FM 21-40	150 Watts	0%	8 days	37.34	0.00	100.00
BDU	FM 21-40	150 Watts	0%	4 days	37.48	.01	99.99
BDU	FM 21-40	150 Watts	0%	0 days	37.95	.15	99.85
BDU	FM 21-40	150 Watts	2%	12 days	37.70	.03	99.97
BDU	FM 21-40	150 Watts	2%	8 days	37.79	.05	99.95
BDU	FM 21-40	150 Watts	2%	4 days	37.95	.15	99.85
BDU	FM 21-40	150 Watts	2%	0 days	38.30	1.05	98.95
BDU	FM 21-40	150 Watts	4%	12 days	38.30	1.05	98.95
BDU	FM 21-40	150 Watts	4%	8 days	38.39	1.64	98.36
BDU	FM 21-40	150 Watts	4%	4 days	38.50	2.76	97.24
BDU	FM 21-40	150 Watts	4%	0 days	38.65	5.05	94.95
BDU	FM 21-40	150 Watts	6%	12 days	38.99	16.53	83.47
BDU	FM 21-40	150 Watts	6%	8 days	38.99	16.53	83.47
BDU	FM 21-40	150 Watts	6%	4 days	38.99	16.53	83.47
BDU	FM 21-40	150 Watts	6%	0 days	38.99	16.53	83.47

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	FM 21-40	300 Watts	0%	12 days	37.71	.03	43.99
BDU	FM 21-40	300 Watts	0%	8 days	37.76	.04	43.98
BDU	FM 21-40	300 Watts	0%	4 days	37.95	.14	43.94
BDU	FM 21-40	300 Watts	0%	0 days	38.58	3.82	42.32
BDU	FM 21-40	300 Watts	2%	12 days	38.13	.42	43.82
BDU	FM 21-40	300 Watts	2%	8 days	38.24	.76	43.67
BDU	FM 21-40	300 Watts	2%	4 days	38.46	2.28	43.00
BDU	FM 21-40	300 Watts	2%	0 days	38.93	13.47	38.07
BDU	FM 21-40	300 Watts	4%	12 days	38.81	9.17	39.97
BDU	FM 21-40	300 Watts	4%	8 days	38.93	13.52	38.05
BDU	FM 21-40	300 Watts	4%	4 days	39.08	20.92	34.80
BDU	FM 21-40	300 Watts	4%	0 days	39.27	33.10	29.44
BDU	FM 21-40	300 Watts	6%	12 days	39.62	59.12	17.99
BDU	FM 21-40	300 Watts	6%	8 days	39.62	59.12	17.99
BDU	FM 21-40	300 Watts	6%	4 days	39.62	59.12	17.99
BDU	FM 21-40	300 Watts	6%	0 days	39.62	59.12	17.99
BDU	FM 21-40	400 Watts	0%	12 days	38.06	.28	43.88
BDU	FM 21-40	400 Watts	0%	8 days	38.12	.40	43.82
BDU	FM 21-40	400 Watts	0%	4 days	38.33	1.24	43.45
BDU	FM 21-40	400 Watts	0%	0 days	39.05	19.54	35.40
BDU	FM 21-40	400 Watts	2%	12 days	38.49	2.63	42.84
BDU	FM 21-40	400 Watts	2%	8 days	38.61	4.43	42.05
BDU	FM 21-40	400 Watts	2%	4 days	38.87	11.23	39.06
BDU	FM 21-40	400 Watts	2%	0 days	39.40	42.44	25.33
BDU	FM 21-40	400 Watts	4%	12 days	39.22	29.23	31.14
BDU	FM 21-40	400 Watts	4%	8 days	39.35	38.75	26.95
BDU	FM 21-40	400 Watts	4%	4 days	39.52	51.92	21.16
BDU	FM 21-40	400 Watts	4%	0 days	39.75	68.33	13.93
BDU	FM 21-40	400 Watts	6%	12 days	40.09	87.38	5.55
BDU	FM 21-40	400 Watts	6%	8 days	40.09	87.38	5.55
BDU	FM 21-40	400 Watts	6%	4 days	40.09	87.38	5.55
BDU	FM 21-40	400 Watts	6%	0 days	40.09	87.38	5.55
BDU	FM 21-40	500 Watts	0%	12 days	38.11	.37	37.86
BDU	FM 21-40	500 Watts	0%	8 days	38.17	.54	37.79
BDU	FM 21-40	500 Watts	0%	4 days	38.39	1.65	37.37
BDU	FM 21-40	500 Watts	0%	0 days	39.15	24.91	28.53
BDU	FM 21-40	500 Watts	2%	12 days	38.55	3.32	36.74
BDU	FM 21-40	500 Watts	2%	8 days	38.67	5.55	35.89
BDU	FM 21-40	500 Watts	2%	4 days	38.94	13.87	32.73
BDU	FM 21-40	500 Watts	2%	0 days	39.49	49.61	19.15
BDU	FM 21-40	500 Watts	4%	12 days	39.28	33.78	25.16
BDU	FM 21-40	500 Watts	4%	8 days	39.42	44.19	21.21
BDU	FM 21-40	500 Watts	4%	4 days	39.61	58.11	15.92
BDU	FM 21-40	500 Watts	4%	0 days	39.84	74.46	9.71
BDU	FM 21-40	500 Watts	6%	12 days	40.19	90.75	3.52
BDU	FM 21-40	500 Watts	6%	8 days	40.19	90.75	3.52
BDU	FM 21-40	500 Watts	6%	4 days	40.19	90.75	3.52
BDU	FM 21-40	500 Watts	6%	0 days	40.19	90.75	3.52
BDU	FM 21-40	600 Watts	0%	12 days	38.38	1.56	37.41
BDU	FM 21-40	600 Watts	0%	8 days	38.45	2.13	37.19
BDU	FM 21-40	600 Watts	0%	4 days	38.67	5.52	35.90
BDU	FM 21-40	600 Watts	0%	0 days	39.49	49.00	19.38
BDU	FM 21-40	600 Watts	2%	12 days	38.82	9.50	34.39
BDU	FM 21-40	600 Watts	2%	8 days	38.95	14.36	32.54
BDU	FM 21-40	600 Watts	2%	4 days	39.23	30.10	26.56
BDU	FM 21-40	600 Watts	2%	0 days	39.83	73.97	9.89
BDU	FM 21-40	600 Watts	4%	12 days	39.58	55.81	16.79
BDU	FM 21-40	600 Watts	4%	8 days	39.73	67.00	12.54
BDU	FM 21-40	600 Watts	4%	4 days	39.93	79.36	7.84
BDU	FM 21-40	600 Watts	4%	0 days	40.18	90.49	3.61
BDU	FM 21-40	600 Watts	6%	12 days	40.53	97.60	.91
BDU	FM 21-40	600 Watts	6%	8 days	40.53	97.60	.91
BDU	FM 21-40	600 Watts	6%	4 days	40.53	97.60	.91
BDU	FM 21-40	600 Watts	6%	0 days	40.53	97.60	.91

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	FM 21-10 VARIANT	105 Watts	0%	12 days	37.10	0.00	100.00
BDU	FM 21-10 VARIANT	105 Watts	0%	8 days	37.14	0.00	100.00
BDU	FM 21-10 VARIANT	105 Watts	0%	4 days	37.26	0.00	100.00
BDU	FM 21-10 VARIANT	105 Watts	0%	0 days	37.66	.02	99.98
BDU	FM 21-10 VARIANT	105 Watts	2%	12 days	37.50	.01	99.99
BDU	FM 21-10 VARIANT	105 Watts	2%	8 days	37.57	.01	99.99
BDU	FM 21-10 VARIANT	105 Watts	2%	4 days	37.71	.03	99.97
BDU	FM 21-10 VARIANT	105 Watts	2%	0 days	38.01	.21	99.79
BDU	FM 21-10 VARIANT	105 Watts	4%	12 days	38.06	.28	99.72
BDU	FM 21-10 VARIANT	105 Watts	4%	8 days	38.14	.44	99.56
BDU	FM 21-10 VARIANT	105 Watts	4%	4 days	38.23	.74	99.26
BDU	FM 21-10 VARIANT	105 Watts	4%	0 days	38.36	1.39	98.61
BDU	FM 21-10 VARIANT	105 Watts	6%	12 days	38.70	6.28	93.72
BDU	FM 21-10 VARIANT	105 Watts	6%	8 days	38.70	6.28	93.72
BDU	FM 21-10 VARIANT	105 Watts	6%	4 days	38.70	6.28	93.72
BDU	FM 21-10 VARIANT	105 Watts	6%	0 days	38.70	6.28	93.72
BDU	FM 21-10 VARIANT	150 Watts	0%	12 days	37.28	0.00	93.00
BDU	FM 21-10 VARIANT	150 Watts	0%	8 days	37.32	0.00	93.00
BDU	FM 21-10 VARIANT	150 Watts	0%	4 days	37.46	0.00	93.00
BDU	FM 21-10 VARIANT	150 Watts	0%	0 days	37.92	.12	92.89
BDU	FM 21-10 VARIANT	150 Watts	2%	12 days	37.69	.02	92.98
BDU	FM 21-10 VARIANT	150 Watts	2%	8 days	37.77	.04	92.96
BDU	FM 21-10 VARIANT	150 Watts	2%	4 days	37.93	.13	92.88
BDU	FM 21-10 VARIANT	150 Watts	2%	0 days	38.27	.91	92.15
BDU	FM 21-10 VARIANT	150 Watts	4%	12 days	38.28	.94	92.13
BDU	FM 21-10 VARIANT	150 Watts	4%	8 days	38.37	1.46	91.64
BDU	FM 21-10 VARIANT	150 Watts	4%	4 days	38.48	2.46	90.71
BDU	FM 21-10 VARIANT	150 Watts	4%	0 days	38.62	4.50	88.82
BDU	FM 21-10 VARIANT	150 Watts	6%	12 days	38.97	15.19	78.87
BDU	FM 21-10 VARIANT	150 Watts	6%	8 days	38.97	15.19	78.87
BDU	FM 21-10 VARIANT	150 Watts	6%	4 days	38.97	15.19	78.87
BDU	FM 21-10 VARIANT	150 Watts	6%	0 days	38.97	15.19	78.87
BDU	FM 21-10 VARIANT	300 Watts	0%	12 days	37.94	.14	92.87
BDU	FM 21-10 VARIANT	300 Watts	0%	8 days	38.00	.20	92.81
BDU	FM 21-10 VARIANT	300 Watts	0%	4 days	38.20	.62	92.42
BDU	FM 21-10 VARIANT	300 Watts	0%	0 days	38.86	10.90	82.86
BDU	FM 21-10 VARIANT	300 Watts	2%	12 days	38.37	1.50	91.61
BDU	FM 21-10 VARIANT	300 Watts	2%	8 days	38.49	2.57	90.61
BDU	FM 21-10 VARIANT	300 Watts	2%	4 days	38.72	6.74	86.73
BDU	FM 21-10 VARIANT	300 Watts	2%	0 days	39.21	28.62	66.38
BDU	FM 21-10 VARIANT	300 Watts	4%	12 days	39.07	20.39	74.04
BDU	FM 21-10 VARIANT	300 Watts	4%	8 days	39.19	27.82	67.13
BDU	FM 21-10 VARIANT	300 Watts	4%	4 days	39.35	38.83	56.89
BDU	FM 21-10 VARIANT	300 Watts	4%	0 days	39.55	54.11	42.68
BDU	FM 21-10 VARIANT	300 Watts	6%	12 days	39.90	77.96	20.50
BDU	FM 21-10 VARIANT	300 Watts	6%	8 days	39.90	77.96	20.50
BDU	FM 21-10 VARIANT	300 Watts	6%	4 days	39.90	77.96	20.50
BDU	FM 21-10 VARIANT	300 Watts	6%	0 days	39.90	77.96	20.50
BDU	FM 21-10 VARIANT	400 Watts	0%	12 days	38.44	2.08	91.07
BDU	FM 21-10 VARIANT	400 Watts	0%	8 days	38.51	2.83	90.37
BDU	FM 21-10 VARIANT	400 Watts	0%	4 days	38.73	7.02	86.47
BDU	FM 21-10 VARIANT	400 Watts	0%	0 days	39.48	48.32	48.06
BDU	FM 21-10 VARIANT	400 Watts	2%	12 days	38.88	11.73	82.09
BDU	FM 21-10 VARIANT	400 Watts	2%	8 days	39.01	17.39	76.83
BDU	FM 21-10 VARIANT	400 Watts	2%	4 days	39.28	33.50	61.85
BDU	FM 21-10 VARIANT	400 Watts	2%	0 days	39.83	73.42	24.72
BDU	FM 21-10 VARIANT	400 Watts	4%	12 days	39.63	59.54	37.63
BDU	FM 21-10 VARIANT	400 Watts	4%	8 days	39.77	69.57	28.30
BDU	FM 21-10 VARIANT	400 Watts	4%	4 days	39.94	80.40	18.23
BDU	FM 21-10 VARIANT	400 Watts	4%	0 days	40.17	90.20	9.11
BDU	FM 21-10 VARIANT	400 Watts	6%	12 days	40.52	97.50	2.33
BDU	FM 21-10 VARIANT	400 Watts	6%	8 days	40.52	97.50	2.33
BDU	FM 21-10 VARIANT	400 Watts	6%	4 days	40.52	97.50	2.33
BDU	FM 21-10 VARIANT	400 Watts	6%	0 days	40.52	97.50	2.33

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	FM 21-10 VARIANT	500 Watts	0%	12 days	38.98	15.96	78.16
BDU	FM 21-10 VARIANT	500 Watts	0%	8 days	39.06	19.78	74.60
BDU	FM 21-10 VARIANT	500 Watts	0%	4 days	39.31	35.84	59.67
BDU	FM 21-10 VARIANT	500 Watts	0%	0 days	40.15	89.48	9.78
BDU	FM 21-10 VARIANT	500 Watts	2%	12 days	39.44	45.03	51.12
BDU	FM 21-10 VARIANT	500 Watts	2%	8 days	39.58	56.21	40.72
BDU	FM 21-10 VARIANT	500 Watts	2%	4 days	39.88	76.86	21.52
BDU	FM 21-10 VARIANT	500 Watts	2%	0 days	40.50	97.26	2.55
BDU	FM 21-10 VARIANT	500 Watts	4%	12 days	40.23	91.95	7.49
BDU	FM 21-10 VARIANT	500 Watts	4%	8 days	40.39	95.61	4.08
BDU	FM 21-10 VARIANT	500 Watts	4%	4 days	40.59	98.19	1.68
BDU	FM 21-10 VARIANT	500 Watts	4%	0 days	40.84	99.52	.45
BDU	FM 21-10 VARIANT	500 Watts	6%	12 days	41.19	99.94	.06
BDU	FM 21-10 VARIANT	500 Watts	6%	8 days	41.19	99.94	.06
BDU	FM 21-10 VARIANT	500 Watts	6%	4 days	41.19	99.94	.06
BDU	FM 21-10 VARIANT	500 Watts	6%	0 days	41.19	99.94	.06
BDU	FM 21-10 VARIANT	600 Watts	0%	12 days	39.59	56.92	40.06
BDU	FM 21-10 VARIANT	600 Watts	0%	8 days	39.67	63.13	34.29
BDU	FM 21-10 VARIANT	600 Watts	0%	4 days	39.95	80.77	17.88
BDU	FM 21-10 VARIANT	600 Watts	0%	0 days	40.87	99.59	.38
BDU	FM 21-10 VARIANT	600 Watts	2%	12 days	40.05	85.66	13.34
BDU	FM 21-10 VARIANT	600 Watts	2%	8 days	40.21	91.53	7.88
BDU	FM 21-10 VARIANT	600 Watts	2%	4 days	40.54	97.77	2.07
BDU	FM 21-10 VARIANT	600 Watts	2%	0 days	41.22	99.95	.05
BDU	FM 21-10 VARIANT	600 Watts	4%	12 days	40.89	99.63	.34
BDU	FM 21-10 VARIANT	600 Watts	4%	8 days	41.07	99.87	.12
BDU	FM 21-10 VARIANT	600 Watts	4%	4 days	41.29	99.97	.03
BDU	FM 21-10 VARIANT	600 Watts	4%	0 days	41.57	100.00	0.00
BDU	FM 21-10 VARIANT	600 Watts	6%	12 days	41.91	100.00	0.00
BDU	FM 21-10 VARIANT	600 Watts	6%	8 days	41.91	100.00	0.00
BDU	FM 21-10 VARIANT	600 Watts	6%	4 days	41.91	100.00	0.00
BDU	FM 21-10 VARIANT	600 Watts	6%	0 days	41.91	100.00	0.00
BDU	FM 21-40 VARIANT	105 Watts	0%	12 days	37.10	0.00	100.00
BDU	FM 21-40 VARIANT	105 Watts	0%	8 days	37.14	0.00	100.00
BDU	FM 21-40 VARIANT	105 Watts	0%	4 days	37.26	0.00	100.00
BDU	FM 21-40 VARIANT	105 Watts	0%	0 days	37.66	.02	99.98
BDU	FM 21-40 VARIANT	105 Watts	2%	12 days	37.50	.01	99.99
BDU	FM 21-40 VARIANT	105 Watts	2%	8 days	37.57	.01	99.99
BDU	FM 21-40 VARIANT	105 Watts	2%	4 days	37.71	.03	99.97
BDU	FM 21-40 VARIANT	105 Watts	2%	0 days	38.01	.21	99.79
BDU	FM 21-40 VARIANT	105 Watts	4%	12 days	38.06	.28	99.72
BDU	FM 21-40 VARIANT	105 Watts	4%	8 days	38.14	.44	99.56
BDU	FM 21-40 VARIANT	105 Watts	4%	4 days	38.23	.74	99.26
BDU	FM 21-40 VARIANT	105 Watts	4%	0 days	38.36	1.39	98.61
BDU	FM 21-40 VARIANT	105 Watts	6%	12 days	38.70	6.28	93.72
BDU	FM 21-40 VARIANT	105 Watts	6%	8 days	38.70	6.28	93.72
BDU	FM 21-40 VARIANT	105 Watts	6%	4 days	38.70	6.28	93.72
BDU	FM 21-40 VARIANT	105 Watts	6%	0 days	38.70	6.28	93.72
BDU	FM 21-40 VARIANT	150 Watts	0%	12 days	37.30	0.00	100.00
BDU	FM 21-40 VARIANT	150 Watts	0%	8 days	37.34	0.00	100.00
BDU	FM 21-40 VARIANT	150 Watts	0%	4 days	37.48	.01	99.99
BDU	FM 21-40 VARIANT	150 Watts	0%	0 days	37.95	.15	99.85
BDU	FM 21-40 VARIANT	150 Watts	2%	12 days	37.70	.03	99.97
BDU	FM 21-40 VARIANT	150 Watts	2%	8 days	37.79	.05	99.95
BDU	FM 21-40 VARIANT	150 Watts	2%	4 days	37.95	.15	99.85
BDU	FM 21-40 VARIANT	150 Watts	2%	0 days	38.30	1.05	98.95
BDU	FM 21-40 VARIANT	150 Watts	4%	12 days	38.30	1.05	98.95
BDU	FM 21-40 VARIANT	150 Watts	4%	8 days	38.39	1.64	98.36
BDU	FM 21-40 VARIANT	150 Watts	4%	4 days	38.50	2.76	97.24
BDU	FM 21-40 VARIANT	150 Watts	4%	0 days	38.65	5.05	94.95
BDU	FM 21-40 VARIANT	150 Watts	6%	12 days	38.99	16.53	83.47
BDU	FM 21-40 VARIANT	150 Watts	6%	8 days	38.99	16.53	83.47
BDU	FM 21-40 VARIANT	150 Watts	6%	4 days	38.99	16.53	83.47
BDU	FM 21-40 VARIANT	150 Watts	6%	0 days	38.99	16.53	83.47

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU	FM 21-40 VARIANT	300 Watts	0%	12 days	37.77	.04	52.98
BDU	FM 21-40 VARIANT	300 Watts	0%	8 days	37.82	.06	52.97
BDU	FM 21-40 VARIANT	300 Watts	0%	4 days	38.00	.19	52.90
BDU	FM 21-40 VARIANT	300 Watts	0%	0 days	38.59	4.06	50.85
BDU	FM 21-40 VARIANT	300 Watts	2%	12 days	38.19	.58	52.69
BDU	FM 21-40 VARIANT	300 Watts	2%	8 days	38.29	1.00	52.47
BDU	FM 21-40 VARIANT	300 Watts	2%	4 days	38.50	2.76	51.54
BDU	FM 21-40 VARIANT	300 Watts	2%	0 days	38.94	14.07	45.54
BDU	FM 21-40 VARIANT	300 Watts	4%	12 days	38.85	10.56	47.40
BDU	FM 21-40 VARIANT	300 Watts	4%	8 days	38.96	15.04	45.03
BDU	FM 21-40 VARIANT	300 Watts	4%	4 days	39.10	22.36	41.15
BDU	FM 21-40 VARIANT	300 Watts	4%	0 days	39.29	34.09	34.93
BDU	FM 21-40 VARIANT	300 Watts	6%	12 days	39.63	60.13	21.13
BDU	FM 21-40 VARIANT	300 Watts	6%	8 days	39.63	60.13	21.13
BDU	FM 21-40 VARIANT	300 Watts	6%	4 days	39.63	60.13	21.13
BDU	FM 21-40 VARIANT	300 Watts	6%	0 days	39.63	60.13	21.13
BDU	FM 21-40 VARIANT	400 Watts	0%	12 days	38.20	.63	52.67
BDU	FM 21-40 VARIANT	400 Watts	0%	8 days	38.27	.88	52.53
BDU	FM 21-40 VARIANT	400 Watts	0%	4 days	38.48	2.44	51.71
BDU	FM 21-40 VARIANT	400 Watts	0%	0 days	39.17	26.44	38.99
BDU	FM 21-40 VARIANT	400 Watts	2%	12 days	38.64	4.86	50.42
BDU	FM 21-40 VARIANT	400 Watts	2%	8 days	38.76	7.68	48.93
BDU	FM 21-40 VARIANT	400 Watts	2%	4 days	39.01	17.13	43.92
BDU	FM 21-40 VARIANT	400 Watts	2%	0 days	39.52	51.46	25.73
BDU	FM 21-40 VARIANT	400 Watts	4%	12 days	39.35	38.87	32.40
BDU	FM 21-40 VARIANT	400 Watts	4%	8 days	39.48	48.81	27.13
BDU	FM 21-40 VARIANT	400 Watts	4%	4 days	39.65	61.50	20.41
BDU	FM 21-40 VARIANT	400 Watts	4%	0 days	39.87	75.89	12.78
BDU	FM 21-40 VARIANT	400 Watts	6%	12 days	40.21	91.45	4.53
BDU	FM 21-40 VARIANT	400 Watts	6%	8 days	40.21	91.45	4.53
BDU	FM 21-40 VARIANT	400 Watts	6%	4 days	40.21	91.45	4.53
BDU	FM 21-40 VARIANT	400 Watts	6%	0 days	40.21	91.45	4.53
BDU	FM 21-40 VARIANT	500 Watts	0%	12 days	38.39	1.83	43.19
BDU	FM 21-40 VARIANT	500 Watts	0%	8 days	38.45	2.52	42.89
BDU	FM 21-40 VARIANT	500 Watts	0%	4 days	38.66	6.58	41.10
BDU	FM 21-40 VARIANT	500 Watts	0%	0 days	39.37	51.15	21.49
BDU	FM 21-40 VARIANT	500 Watts	2%	12 days	38.82	10.80	39.25
BDU	FM 21-40 VARIANT	500 Watts	2%	8 days	38.94	16.40	36.78
BDU	FM 21-40 VARIANT	500 Watts	2%	4 days	39.19	33.02	29.47
BDU	FM 21-40 VARIANT	500 Watts	2%	0 days	39.71	75.69	10.70
BDU	FM 21-40 VARIANT	500 Watts	4%	12 days	39.54	59.82	17.68
BDU	FM 21-40 VARIANT	500 Watts	4%	8 days	39.67	69.72	13.32
BDU	FM 21-40 VARIANT	500 Watts	4%	4 days	39.84	81.24	8.25
BDU	FM 21-40 VARIANT	500 Watts	4%	0 days	40.06	91.36	3.80
BDU	FM 21-40 VARIANT	500 Watts	6%	12 days	40.41	97.89	.93
BDU	FM 21-40 VARIANT	500 Watts	6%	8 days	40.41	97.89	.93
BDU	FM 21-40 VARIANT	500 Watts	6%	4 days	40.41	97.89	.93
BDU	FM 21-40 VARIANT	500 Watts	6%	0 days	40.41	97.89	.93
BDU	FM 21-40 VARIANT	600 Watts	0%	12 days	38.82	9.54	39.80
BDU	FM 21-40 VARIANT	600 Watts	0%	8 days	38.90	12.30	38.59
BDU	FM 21-40 VARIANT	600 Watts	0%	4 days	39.15	25.33	32.85
BDU	FM 21-40 VARIANT	600 Watts	0%	0 days	40.04	85.13	6.54
BDU	FM 21-40 VARIANT	600 Watts	2%	12 days	39.27	33.16	29.41
BDU	FM 21-40 VARIANT	600 Watts	2%	8 days	39.42	44.07	24.61
BDU	FM 21-40 VARIANT	600 Watts	2%	4 days	39.73	67.26	14.41
BDU	FM 21-40 VARIANT	600 Watts	2%	0 days	40.39	95.63	1.92
BDU	FM 21-40 VARIANT	600 Watts	4%	12 days	40.08	86.74	5.83
BDU	FM 21-40 VARIANT	600 Watts	4%	8 days	40.25	92.42	3.34
BDU	FM 21-40 VARIANT	600 Watts	4%	4 days	40.46	96.75	1.43
BDU	FM 21-40 VARIANT	600 Watts	4%	0 days	40.74	99.13	.38
BDU	FM 21-40 VARIANT	600 Watts	6%	12 days	41.08	99.88	.05
BDU	FM 21-40 VARIANT	600 Watts	6%	8 days	41.08	99.88	.05
BDU	FM 21-40 VARIANT	600 Watts	6%	4 days	41.08	99.88	.05
BDU	FM 21-40 VARIANT	600 Watts	6%	0 days	41.08	99.88	.05

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDO IV	NONE	105 Watts	0%	12 days	37.26	0.00	100.00
BDO IV	NONE	105 Watts	0%	8 days	37.29	0.00	100.00
BDO IV	NONE	105 Watts	0%	4 days	37.40	0.00	100.00
BDO IV	NONE	105 Watts	0%	0 days	37.79	.05	99.95
BDO IV	NONE	105 Watts	2%	12 days	37.65	.02	99.98
BDO IV	NONE	105 Watts	2%	8 days	37.72	.03	99.97
BDO IV	NONE	105 Watts	2%	4 days	37.84	.07	99.93
BDO IV	NONE	105 Watts	2%	0 days	38.14	.43	99.57
BDO IV	NONE	105 Watts	4%	12 days	38.19	.59	99.41
BDO IV	NONE	105 Watts	4%	8 days	38.26	.85	99.15
BDO IV	NONE	105 Watts	4%	4 days	38.36	1.40	98.60
BDO IV	NONE	105 Watts	4%	0 days	38.48	2.52	97.48
BDO IV	NONE	105 Watts	6%	12 days	38.83	9.86	90.14
BDO IV	NONE	105 Watts	6%	8 days	38.83	9.86	90.14
BDO IV	NONE	105 Watts	6%	4 days	38.83	9.86	90.14
BDO IV	NONE	105 Watts	6%	0 days	38.83	9.86	90.14
BDO IV	NONE	150 Watts	0%	12 days	37.50	.01	99.99
BDO IV	NONE	150 Watts	0%	8 days	37.54	.01	99.99
BDO IV	NONE	150 Watts	0%	4 days	37.67	.02	99.98
BDO IV	NONE	150 Watts	0%	0 days	38.11	.37	99.63
BDO IV	NONE	150 Watts	2%	12 days	37.90	.11	99.89
BDO IV	NONE	150 Watts	2%	8 days	37.98	.17	99.83
BDO IV	NONE	150 Watts	2%	4 days	38.13	.42	99.58
BDO IV	NONE	150 Watts	2%	0 days	38.45	2.22	97.78
BDO IV	NONE	150 Watts	4%	12 days	38.48	2.43	97.57
BDO IV	NONE	150 Watts	4%	8 days	38.56	3.46	96.54
BDO IV	NONE	150 Watts	4%	4 days	38.66	5.25	94.75
BDO IV	NONE	150 Watts	4%	0 days	38.80	8.96	91.04
BDO IV	NONE	150 Watts	6%	12 days	39.15	24.97	75.03
BDO IV	NONE	150 Watts	6%	8 days	39.15	24.97	75.03
BDO IV	NONE	150 Watts	6%	4 days	39.15	24.97	75.03
BDO IV	NONE	150 Watts	6%	0 days	39.15	24.97	75.03
BDO IV	NONE	300 Watts	0%	12 days	38.41	1.77	98.23
BDO IV	NONE	300 Watts	0%	8 days	38.46	2.30	97.70
BDO IV	NONE	300 Watts	0%	4 days	38.65	5.11	94.89
BDO IV	NONE	300 Watts	0%	0 days	39.27	33.08	66.92
BDO IV	NONE	300 Watts	2%	12 days	38.83	9.93	90.07
BDO IV	NONE	300 Watts	2%	8 days	38.94	14.07	85.93
BDO IV	NONE	300 Watts	2%	4 days	39.16	25.81	74.19
BDO IV	NONE	300 Watts	2%	0 days	39.62	59.09	40.91
BDO IV	NONE	300 Watts	4%	12 days	39.51	50.74	49.26
BDO IV	NONE	300 Watts	4%	8 days	39.63	59.66	40.34
BDO IV	NONE	300 Watts	4%	4 days	39.78	70.27	29.73
BDO IV	NONE	300 Watts	4%	0 days	39.97	81.53	18.47
BDO IV	NONE	300 Watts	6%	12 days	40.31	94.12	5.88
BDO IV	NONE	300 Watts	6%	8 days	40.31	94.12	5.88
BDO IV	NONE	300 Watts	6%	4 days	40.31	94.12	5.88
BDO IV	NONE	300 Watts	6%	0 days	40.31	94.12	5.88
BDO IV	NONE	400 Watts	0%	12 days	39.14	24.25	75.75
BDO IV	NONE	400 Watts	0%	8 days	39.20	28.43	71.57
BDO IV	NONE	400 Watts	0%	4 days	39.42	44.24	55.76
BDO IV	NONE	400 Watts	0%	0 days	40.16	89.75	10.25
BDO IV	NONE	400 Watts	2%	12 days	39.58	55.85	44.15
BDO IV	NONE	400 Watts	2%	8 days	39.70	65.28	34.72
BDO IV	NONE	400 Watts	2%	4 days	39.97	81.53	18.47
BDO IV	NONE	400 Watts	2%	0 days	40.51	97.35	2.65
BDO IV	NONE	400 Watts	4%	12 days	40.31	94.12	5.88
BDO IV	NONE	400 Watts	4%	8 days	40.45	96.65	3.35
BDO IV	NONE	400 Watts	4%	4 days	40.63	98.50	1.50
BDO IV	NONE	400 Watts	4%	0 days	40.85	99.54	.46
BDO IV	NONE	400 Watts	6%	12 days	41.20	99.95	.05
BDO IV	NONE	400 Watts	6%	8 days	41.20	99.95	.05
BDO IV	NONE	400 Watts	6%	4 days	41.20	99.95	.05
BDO IV	NONE	400 Watts	6%	0 days	41.20	99.95	.05

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDO IV	NONE	500 Watts	0%	12 days	40.03	84.66	15.34
BDO IV	NONE	500 Watts	0%	8 days	40.11	87.83	12.17
BDO IV	NONE	500 Watts	0%	4 days	40.36	95.03	4.97
BDO IV	NONE	500 Watts	0%	0 days	41.19	99.94	.06
BDO IV	NONE	500 Watts	2%	12 days	40.48	97.06	2.94
BDO IV	NONE	500 Watts	2%	8 days	40.63	98.49	1.51
BDO IV	NONE	500 Watts	2%	4 days	40.92	99.69	.31
BDO IV	NONE	500 Watts	2%	0 days	41.53	100.00	0.00
BDO IV	NONE	500 Watts	4%	12 days	41.27	99.97	.03
BDO IV	NONE	500 Watts	4%	8 days	41.43	99.99	.01
BDO IV	NONE	500 Watts	4%	4 days	41.63	100.00	0.00
BDO IV	NONE	500 Watts	4%	0 days	41.88	100.00	0.00
BDO IV	NONE	500 Watts	6%	12 days	42.23	100.00	0.00
BDO IV	NONE	500 Watts	6%	8 days	42.23	100.00	0.00
BDO IV	NONE	500 Watts	6%	4 days	42.23	100.00	0.00
BDO IV	NONE	500 Watts	6%	0 days	42.23	100.00	0.00
BDO IV	NONE	600 Watts	0%	12 days	41.17	99.94	.06
BDO IV	NONE	600 Watts	0%	8 days	41.26	99.96	.04
BDO IV	NONE	600 Watts	0%	4 days	41.53	100.00	0.00
BDO IV	NONE	600 Watts	0%	0 days	42.44	100.00	0.00
BDO IV	NONE	600 Watts	2%	12 days	41.63	100.00	0.00
BDO IV	NONE	600 Watts	2%	8 days	41.79	100.00	0.00
BDO IV	NONE	600 Watts	2%	4 days	42.12	100.00	0.00
BDO IV	NONE	600 Watts	2%	0 days	42.78	100.00	0.00
BDO IV	NONE	600 Watts	4%	12 days	42.46	100.00	0.00
BDO IV	NONE	600 Watts	4%	8 days	42.64	100.00	0.00
BDO IV	NONE	600 Watts	4%	4 days	42.85	100.00	0.00
BDO IV	NONE	600 Watts	4%	0 days	43.13	100.00	0.00
BDO IV	NONE	600 Watts	6%	12 days	43.48	100.00	0.00
BDO IV	NONE	600 Watts	6%	8 days	43.48	100.00	0.00
BDO IV	NONE	600 Watts	6%	4 days	43.48	100.00	0.00
BDO IV	NONE	600 Watts	6%	0 days	43.48	100.00	0.00
BDO IV	FM 21-10	105 Watts	0%	12 days	37.26	0.00	100.00
BDO IV	FM 21-10	105 Watts	0%	8 days	37.29	0.00	100.00
BDO IV	FM 21-10	105 Watts	0%	4 days	37.40	0.00	100.00
BDO IV	FM 21-10	105 Watts	0%	0 days	37.79	.05	99.95
BDO IV	FM 21-10	105 Watts	2%	12 days	37.65	.02	99.98
BDO IV	FM 21-10	105 Watts	2%	8 days	37.72	.03	99.97
BDO IV	FM 21-10	105 Watts	2%	4 days	37.84	.07	99.93
BDO IV	FM 21-10	105 Watts	2%	0 days	38.14	.43	99.57
BDO IV	FM 21-10	105 Watts	4%	12 days	38.19	.59	99.41
BDO IV	FM 21-10	105 Watts	4%	8 days	38.26	.85	99.15
BDO IV	FM 21-10	105 Watts	4%	4 days	38.36	1.40	98.60
BDO IV	FM 21-10	105 Watts	4%	0 days	38.48	2.52	97.48
BDO IV	FM 21-10	105 Watts	6%	12 days	38.83	9.86	90.14
BDO IV	FM 21-10	105 Watts	6%	8 days	38.83	9.86	90.14
BDO IV	FM 21-10	105 Watts	6%	4 days	38.83	9.86	90.14
BDO IV	FM 21-10	105 Watts	6%	0 days	38.83	9.86	90.14
BDO IV	FM 21-10	150 Watts	0%	12 days	37.35	0.00	33.00
BDO IV	FM 21-10	150 Watts	0%	8 days	37.39	0.00	33.00
BDO IV	FM 21-10	150 Watts	0%	4 days	37.50	.01	33.00
BDO IV	FM 21-10	150 Watts	0%	0 days	37.91	.11	32.96
BDO IV	FM 21-10	150 Watts	2%	12 days	37.75	.04	32.99
BDO IV	FM 21-10	150 Watts	2%	8 days	37.82	.06	32.98
BDO IV	FM 21-10	150 Watts	2%	4 days	37.95	.15	32.95
BDO IV	FM 21-10	150 Watts	2%	0 days	38.26	.85	32.72
BDO IV	FM 21-10	150 Watts	4%	12 days	38.30	1.06	32.65
BDO IV	FM 21-10	150 Watts	4%	8 days	38.37	1.51	32.50
BDO IV	FM 21-10	150 Watts	4%	4 days	38.47	2.42	32.20
BDO IV	FM 21-10	150 Watts	4%	0 days	38.61	4.28	31.59
BDO IV	FM 21-10	150 Watts	6%	12 days	38.95	14.66	28.16
BDO IV	FM 21-10	150 Watts	6%	8 days	38.95	14.66	28.16
BDO IV	FM 21-10	150 Watts	6%	4 days	38.95	14.66	28.16
BDO IV	FM 21-10	150 Watts	6%	0 days	38.95	14.66	28.16

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDO IV	FM 21-10	300 Watts	0%	12 days	37.76	.04	32.99
BDO IV	FM 21-10	300 Watts	0%	8 days	37.80	.05	32.98
BDO IV	FM 21-10	300 Watts	0%	4 days	37.95	.15	32.95
BDO IV	FM 21-10	300 Watts	0%	0 days	38.47	2.40	32.21
BDO IV	FM 21-10	300 Watts	2%	12 days	38.17	.51	32.83
BDO IV	FM 21-10	300 Watts	2%	8 days	38.25	.83	32.73
BDO IV	FM 21-10	300 Watts	2%	4 days	38.44	2.04	32.33
BDO IV	FM 21-10	300 Watts	2%	0 days	38.82	9.50	29.87
BDO IV	FM 21-10	300 Watts	4%	12 days	38.78	8.40	30.23
BDO IV	FM 21-10	300 Watts	4%	8 days	38.88	11.68	29.15
BDO IV	FM 21-10	300 Watts	4%	4 days	39.01	17.08	27.36
BDO IV	FM 21-10	300 Watts	4%	0 days	39.17	26.01	24.42
BDO IV	FM 21-10	300 Watts	6%	12 days	39.51	50.98	16.18
BDO IV	FM 21-10	300 Watts	6%	8 days	39.51	50.98	16.18
BDO IV	FM 21-10	300 Watts	6%	4 days	39.51	50.98	16.18
BDO IV	FM 21-10	300 Watts	6%	0 days	39.51	50.98	16.18
BDO IV	FM 21-10	400 Watts	0%	12 days	38.06	.28	32.91
BDO IV	FM 21-10	400 Watts	0%	8 days	38.11	.38	32.87
BDO IV	FM 21-10	400 Watts	0%	4 days	38.28	.96	32.68
BDO IV	FM 21-10	400 Watts	0%	0 days	38.87	11.43	29.23
BDO IV	FM 21-10	400 Watts	2%	12 days	38.48	2.46	32.19
BDO IV	FM 21-10	400 Watts	2%	8 days	38.58	3.80	31.75
BDO IV	FM 21-10	400 Watts	2%	4 days	38.78	8.43	30.22
BDO IV	FM 21-10	400 Watts	2%	0 days	39.22	29.58	23.24
BDO IV	FM 21-10	400 Watts	4%	12 days	39.13	23.92	25.11
BDO IV	FM 21-10	400 Watts	4%	8 days	39.24	31.01	22.77
BDO IV	FM 21-10	400 Watts	4%	4 days	39.38	41.23	19.39
BDO IV	FM 21-10	400 Watts	4%	0 days	39.57	55.22	14.78
BDO IV	FM 21-10	400 Watts	6%	12 days	39.92	78.78	7.00
BDO IV	FM 21-10	400 Watts	6%	8 days	39.92	78.78	7.00
BDO IV	FM 21-10	400 Watts	6%	4 days	39.92	78.78	7.00
BDO IV	FM 21-10	400 Watts	6%	0 days	39.92	78.78	7.00
BDO IV	FM 21-10	500 Watts	0%	12 days	38.36	1.40	32.54
BDO IV	FM 21-10	500 Watts	0%	8 days	38.41	1.83	32.40
BDO IV	FM 21-10	500 Watts	0%	4 days	38.60	4.17	31.62
BDO IV	FM 21-10	500 Watts	0%	0 days	39.24	30.80	22.84
BDO IV	FM 21-10	500 Watts	2%	12 days	38.78	8.37	30.24
BDO IV	FM 21-10	500 Watts	2%	8 days	38.89	12.02	29.03
BDO IV	FM 21-10	500 Watts	2%	4 days	39.11	22.85	25.46
BDO IV	FM 21-10	500 Watts	2%	0 days	39.59	56.59	14.33
BDO IV	FM 21-10	500 Watts	4%	12 days	39.46	46.96	17.50
BDO IV	FM 21-10	500 Watts	4%	8 days	39.58	56.13	14.48
BDO IV	FM 21-10	500 Watts	4%	4 days	39.73	67.39	10.76
BDO IV	FM 21-10	500 Watts	4%	0 days	39.93	79.77	6.68
BDO IV	FM 21-10	500 Watts	6%	12 days	40.28	93.33	2.20
BDO IV	FM 21-10	500 Watts	6%	8 days	40.28	93.33	2.20
BDO IV	FM 21-10	500 Watts	6%	4 days	40.28	93.33	2.20
BDO IV	FM 21-10	500 Watts	6%	0 days	40.28	93.33	2.20
BDO IV	FM 21-10	600 Watts	0%	12 days	38.68	5.63	31.14
BDO IV	FM 21-10	600 Watts	0%	8 days	38.73	7.00	30.69
BDO IV	FM 21-10	600 Watts	0%	4 days	38.93	13.49	28.55
BDO IV	FM 21-10	600 Watts	0%	0 days	39.59	57.03	14.18
BDO IV	FM 21-10	600 Watts	2%	12 days	39.10	22.21	25.67
BDO IV	FM 21-10	600 Watts	2%	8 days	39.21	29.10	23.40
BDO IV	FM 21-10	600 Watts	2%	4 days	39.45	45.90	17.85
BDO IV	FM 21-10	600 Watts	2%	0 days	39.94	80.09	6.57
BDO IV	FM 21-10	600 Watts	4%	12 days	39.79	71.39	9.44
BDO IV	FM 21-10	600 Watts	4%	8 days	39.92	78.95	6.95
BDO IV	FM 21-10	600 Watts	4%	4 days	40.08	86.73	4.38
BDO IV	FM 21-10	600 Watts	4%	0 days	40.29	93.48	2.15
BDO IV	FM 21-10	600 Watts	6%	12 days	40.63	98.54	.48
BDO IV	FM 21-10	600 Watts	6%	8 days	40.63	98.54	.48
BDO IV	FM 21-10	600 Watts	6%	4 days	40.63	98.54	.48
BDO IV	FM 21-10	600 Watts	6%	0 days	40.63	98.54	.48

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDO IV	MET LIMIT 39oC	105 Watts	0%	12 days	37.26	0.00	100.00
BDO IV	MET LIMIT 39oC	105 Watts	0%	8 days	37.29	0.00	100.00
BDO IV	MET LIMIT 39oC	105 Watts	0%	4 days	37.40	0.00	100.00
BDO IV	MET LIMIT 39oC	105 Watts	0%	0 days	37.79	.05	99.95
BDO IV	MET LIMIT 39oC	105 Watts	2%	12 days	37.65	.02	99.98
BDO IV	MET LIMIT 39oC	105 Watts	2%	8 days	37.72	.03	99.97
BDO IV	MET LIMIT 39oC	105 Watts	2%	4 days	37.84	.07	99.93
BDO IV	MET LIMIT 39oC	105 Watts	2%	0 days	38.14	.43	99.57
BDO IV	MET LIMIT 39oC	105 Watts	4%	12 days	38.19	.59	99.41
BDO IV	MET LIMIT 39oC	105 Watts	4%	8 days	38.26	.85	99.15
BDO IV	MET LIMIT 39oC	105 Watts	4%	4 days	38.36	1.40	98.60
BDO IV	MET LIMIT 39oC	105 Watts	4%	0 days	38.48	2.52	97.48
BDO IV	MET LIMIT 39oC	105 Watts	6%	12 days	38.83	9.86	90.14
BDO IV	MET LIMIT 39oC	105 Watts	6%	8 days	38.83	9.86	90.14
BDO IV	MET LIMIT 39oC	105 Watts	6%	4 days	38.83	9.86	90.14
BDO IV	MET LIMIT 39oC	105 Watts	6%	0 days	38.83	9.86	90.14
BDO IV	MET LIMIT 39oC	150 Watts	0%	12 days	37.50	.01	99.99
BDO IV	MET LIMIT 39oC	150 Watts	0%	8 days	37.54	.01	99.99
BDO IV	MET LIMIT 39oC	150 Watts	0%	4 days	37.67	.02	99.98
BDO IV	MET LIMIT 39oC	150 Watts	0%	0 days	38.11	.37	99.63
BDO IV	MET LIMIT 39oC	150 Watts	2%	12 days	37.90	.11	99.89
BDO IV	MET LIMIT 39oC	150 Watts	2%	8 days	37.98	.17	99.83
BDO IV	MET LIMIT 39oC	150 Watts	2%	4 days	38.13	.42	99.58
BDO IV	MET LIMIT 39oC	150 Watts	2%	0 days	38.45	2.22	97.78
BDO IV	MET LIMIT 39oC	150 Watts	4%	12 days	38.48	2.43	97.57
BDO IV	MET LIMIT 39oC	150 Watts	4%	8 days	38.56	3.46	96.54
BDO IV	MET LIMIT 39oC	150 Watts	4%	4 days	38.66	5.25	94.75
BDO IV	MET LIMIT 39oC	150 Watts	4%	0 days	38.80	8.96	91.04
BDO IV	MET LIMIT 39oC	150 Watts	6%	12 days	39.04	18.84	59.25
BDO IV	MET LIMIT 39oC	150 Watts	6%	8 days	39.04	18.84	59.25
BDO IV	MET LIMIT 39oC	150 Watts	6%	4 days	39.04	18.84	59.25
BDO IV	MET LIMIT 39oC	150 Watts	6%	0 days	39.04	18.84	59.25
BDO IV	MET LIMIT 39oC	300 Watts	0%	12 days	38.41	1.77	98.23
BDO IV	MET LIMIT 39oC	300 Watts	0%	8 days	38.46	2.30	97.70
BDO IV	MET LIMIT 39oC	300 Watts	0%	4 days	38.65	5.11	94.89
BDO IV	MET LIMIT 39oC	300 Watts	0%	0 days	39.04	18.92	71.35
BDO IV	MET LIMIT 39oC	300 Watts	2%	12 days	38.83	9.93	90.07
BDO IV	MET LIMIT 39oC	300 Watts	2%	8 days	38.94	14.07	85.93
BDO IV	MET LIMIT 39oC	300 Watts	2%	4 days	39.04	18.80	77.95
BDO IV	MET LIMIT 39oC	300 Watts	2%	0 days	39.04	19.04	52.62
BDO IV	MET LIMIT 39oC	300 Watts	4%	12 days	39.04	18.88	56.78
BDO IV	MET LIMIT 39oC	300 Watts	4%	8 days	39.04	19.03	50.20
BDO IV	MET LIMIT 39oC	300 Watts	4%	4 days	39.04	19.02	42.11
BDO IV	MET LIMIT 39oC	300 Watts	4%	0 days	39.04	18.97	33.22
BDO IV	MET LIMIT 39oC	300 Watts	6%	12 days	39.04	18.84	13.80
BDO IV	MET LIMIT 39oC	300 Watts	6%	8 days	39.04	18.84	13.80
BDO IV	MET LIMIT 39oC	300 Watts	6%	4 days	39.04	18.84	13.80
BDO IV	MET LIMIT 39oC	300 Watts	6%	0 days	39.04	18.84	13.80
BDO IV	MET LIMIT 39oC	400 Watts	0%	12 days	39.04	18.86	80.33
BDO IV	MET LIMIT 39oC	400 Watts	0%	8 days	39.04	18.94	78.92
BDO IV	MET LIMIT 39oC	400 Watts	0%	4 days	39.04	18.98	72.11
BDO IV	MET LIMIT 39oC	400 Watts	0%	0 days	39.04	18.92	47.03
BDO IV	MET LIMIT 39oC	400 Watts	2%	12 days	39.04	18.92	65.67
BDO IV	MET LIMIT 39oC	400 Watts	2%	8 days	39.04	18.82	60.89
BDO IV	MET LIMIT 39oC	400 Watts	2%	4 days	39.04	18.80	51.16
BDO IV	MET LIMIT 39oC	400 Watts	2%	0 days	39.04	19.04	34.81
BDO IV	MET LIMIT 39oC	400 Watts	4%	12 days	39.04	18.88	37.32
BDO IV	MET LIMIT 39oC	400 Watts	4%	8 days	39.04	19.03	33.20
BDO IV	MET LIMIT 39oC	400 Watts	4%	4 days	39.04	19.02	28.34
BDO IV	MET LIMIT 39oC	400 Watts	4%	0 days	39.04	18.97	21.88
BDO IV	MET LIMIT 39oC	400 Watts	6%	12 days	39.04	18.84	8.93
BDO IV	MET LIMIT 39oC	400 Watts	6%	8 days	39.04	18.84	8.93
BDO IV	MET LIMIT 39oC	400 Watts	6%	4 days	39.04	18.84	8.93
BDO IV	MET LIMIT 39oC	400 Watts	6%	0 days	39.04	18.84	8.93

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDO IV	MET LIMIT 39oC	500 Watts	0%	12 days	39.04	18.86	61.67
BDO IV	MET LIMIT 39oC	500 Watts	0%	8 days	39.04	18.64	60.21
BDO IV	MET LIMIT 39oC	500 Watts	0%	4 days	39.04	18.98	53.47
BDO IV	MET LIMIT 39oC	500 Watts	0%	0 days	39.04	18.92	35.68
BDO IV	MET LIMIT 39oC	500 Watts	2%	12 days	39.04	18.92	48.65
BDO IV	MET LIMIT 39oC	500 Watts	2%	8 days	39.04	18.82	45.46
BDO IV	MET LIMIT 39oC	500 Watts	2%	4 days	39.04	18.80	38.16
BDO IV	MET LIMIT 39oC	500 Watts	2%	0 days	39.04	19.04	25.91
BDO IV	MET LIMIT 39oC	500 Watts	4%	12 days	39.04	18.88	27.58
BDO IV	MET LIMIT 39oC	500 Watts	4%	8 days	39.04	19.03	24.29
BDO IV	MET LIMIT 39oC	500 Watts	4%	4 days	39.04	19.02	21.05
BDO IV	MET LIMIT 39oC	500 Watts	4%	0 days	39.04	18.97	16.21
BDO IV	MET LIMIT 39oC	500 Watts	6%	12 days	39.04	18.84	6.49
BDO IV	MET LIMIT 39oC	500 Watts	6%	8 days	39.04	18.84	6.49
BDO IV	MET LIMIT 39oC	500 Watts	6%	4 days	39.04	18.84	6.49
BDO IV	MET LIMIT 39oC	500 Watts	6%	0 days	39.04	18.84	6.49
BDO IV	MET LIMIT 39oC	600 Watts	0%	12 days	39.04	18.86	49.50
BDO IV	MET LIMIT 39oC	600 Watts	0%	8 days	39.04	18.64	48.00
BDO IV	MET LIMIT 39oC	600 Watts	0%	4 days	39.04	18.98	42.94
BDO IV	MET LIMIT 39oC	600 Watts	0%	0 days	39.04	18.92	28.38
BDO IV	MET LIMIT 39oC	600 Watts	2%	12 days	39.04	18.92	38.92
BDO IV	MET LIMIT 39oC	600 Watts	2%	8 days	39.04	18.82	36.53
BDO IV	MET LIMIT 39oC	600 Watts	2%	4 days	39.04	18.80	30.86
BDO IV	MET LIMIT 39oC	600 Watts	2%	0 days	39.04	19.04	21.05
BDO IV	MET LIMIT 39oC	600 Watts	4%	12 days	39.04	18.88	21.90
BDO IV	MET LIMIT 39oC	600 Watts	4%	8 days	39.04	19.03	19.43
BDO IV	MET LIMIT 39oC	600 Watts	4%	4 days	39.04	19.02	17.01
BDO IV	MET LIMIT 39oC	600 Watts	4%	0 days	39.04	18.97	12.96
BDO IV	MET LIMIT 39oC	600 Watts	6%	12 days	39.04	18.84	5.68
BDO IV	MET LIMIT 39oC	600 Watts	6%	8 days	39.04	18.84	5.68
BDO IV	MET LIMIT 39oC	600 Watts	6%	4 days	39.04	18.84	5.68
BDO IV	MET LIMIT 39oC	600 Watts	6%	0 days	39.04	18.84	5.68
BDO IV	MET LIMIT 38.5oC	105 Watts	0%	12 days	37.26	0.00	100.00
BDO IV	MET LIMIT 38.5oC	105 Watts	0%	8 days	37.29	0.00	100.00
BDO IV	MET LIMIT 38.5oC	105 Watts	0%	4 days	37.40	0.00	100.00
BDO IV	MET LIMIT 38.5oC	105 Watts	0%	0 days	37.79	.05	99.95
BDO IV	MET LIMIT 38.5oC	105 Watts	2%	12 days	37.65	.02	99.98
BDO IV	MET LIMIT 38.5oC	105 Watts	2%	8 days	37.72	.03	99.97
BDO IV	MET LIMIT 38.5oC	105 Watts	2%	4 days	37.84	.07	99.93
BDO IV	MET LIMIT 38.5oC	105 Watts	2%	0 days	38.14	.43	99.57
BDO IV	MET LIMIT 38.5oC	105 Watts	4%	12 days	38.19	.59	99.41
BDO IV	MET LIMIT 38.5oC	105 Watts	4%	8 days	38.26	.85	99.15
BDO IV	MET LIMIT 38.5oC	105 Watts	4%	4 days	38.36	1.40	98.60
BDO IV	MET LIMIT 38.5oC	105 Watts	4%	0 days	38.48	2.52	97.48
BDO IV	MET LIMIT 38.5oC	105 Watts	6%	12 days	38.83	9.86	90.14
BDO IV	MET LIMIT 38.5oC	105 Watts	6%	8 days	38.83	9.86	90.14
BDO IV	MET LIMIT 38.5oC	105 Watts	6%	4 days	38.83	9.86	90.14
BDO IV	MET LIMIT 38.5oC	105 Watts	6%	0 days	38.83	9.86	90.14
BDO IV	MET LIMIT 38.5oC	150 Watts	0%	12 days	37.50	.01	99.99
BDO IV	MET LIMIT 38.5oC	150 Watts	0%	8 days	37.54	.01	99.99
BDO IV	MET LIMIT 38.5oC	150 Watts	0%	4 days	37.67	.02	99.98
BDO IV	MET LIMIT 38.5oC	150 Watts	0%	0 days	38.11	.37	99.63
BDO IV	MET LIMIT 38.5oC	150 Watts	2%	12 days	37.90	.11	99.89
BDO IV	MET LIMIT 38.5oC	150 Watts	2%	8 days	37.98	.17	99.83
BDO IV	MET LIMIT 38.5oC	150 Watts	2%	4 days	38.13	.42	99.58
BDO IV	MET LIMIT 38.5oC	150 Watts	2%	0 days	38.45	2.22	97.78
BDO IV	MET LIMIT 38.5oC	150 Watts	4%	12 days	38.48	2.43	97.57
BDO IV	MET LIMIT 38.5oC	150 Watts	4%	8 days	38.50	2.75	91.42
BDO IV	MET LIMIT 38.5oC	150 Watts	4%	4 days	38.53	3.10	62.99
BDO IV	MET LIMIT 38.5oC	150 Watts	4%	0 days	38.53	3.11	25.19
BDO IV	MET LIMIT 38.5oC	150 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	150 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	150 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	150 Watts	6%	0 days	38.83	9.86	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDO IV	MET LIMIT 38.5oC	300 Watts	0%	12 days	38.41	1.77	98.23
BDO IV	MET LIMIT 38.5oC	300 Watts	0%	8 days	38.46	2.30	97.70
BDO IV	MET LIMIT 38.5oC	300 Watts	0%	4 days	38.54	3.17	93.93
BDO IV	MET LIMIT 38.5oC	300 Watts	0%	0 days	38.54	3.18	53.25
BDO IV	MET LIMIT 38.5oC	300 Watts	2%	12 days	38.54	3.17	79.40
BDO IV	MET LIMIT 38.5oC	300 Watts	2%	8 days	38.53	3.16	71.66
BDO IV	MET LIMIT 38.5oC	300 Watts	2%	4 days	38.53	3.12	56.19
BDO IV	MET LIMIT 38.5oC	300 Watts	2%	0 days	38.53	3.11	29.07
BDO IV	MET LIMIT 38.5oC	300 Watts	4%	12 days	38.53	3.07	28.11
BDO IV	MET LIMIT 38.5oC	300 Watts	4%	8 days	38.50	2.75	22.37
BDO IV	MET LIMIT 38.5oC	300 Watts	4%	4 days	38.53	3.10	14.54
BDO IV	MET LIMIT 38.5oC	300 Watts	4%	0 days	38.53	3.11	5.81
BDO IV	MET LIMIT 38.5oC	300 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	300 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	300 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	300 Watts	6%	0 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	400 Watts	0%	12 days	38.53	3.12	74.60
BDO IV	MET LIMIT 38.5oC	400 Watts	0%	8 days	38.53	3.16	71.66
BDO IV	MET LIMIT 38.5oC	400 Watts	0%	4 days	38.54	3.17	61.97
BDO IV	MET LIMIT 38.5oC	400 Watts	0%	0 days	38.54	3.18	34.86
BDO IV	MET LIMIT 38.5oC	400 Watts	2%	12 days	38.56	3.47	52.13
BDO IV	MET LIMIT 38.5oC	400 Watts	2%	8 days	38.53	3.16	47.45
BDO IV	MET LIMIT 38.5oC	400 Watts	2%	4 days	38.53	3.12	46.50
BDO IV	MET LIMIT 38.5oC	400 Watts	2%	0 days	38.53	3.11	19.38
BDO IV	MET LIMIT 38.5oC	400 Watts	4%	12 days	38.53	3.07	18.42
BDO IV	MET LIMIT 38.5oC	400 Watts	4%	8 days	38.53	3.08	14.54
BDO IV	MET LIMIT 38.5oC	400 Watts	4%	4 days	38.53	3.10	9.69
BDO IV	MET LIMIT 38.5oC	400 Watts	4%	0 days	38.53	3.11	3.88
BDO IV	MET LIMIT 38.5oC	400 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	400 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	400 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	400 Watts	6%	0 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	500 Watts	0%	12 days	38.53	3.12	56.19
BDO IV	MET LIMIT 38.5oC	500 Watts	0%	8 days	38.53	3.16	53.26
BDO IV	MET LIMIT 38.5oC	500 Watts	0%	4 days	38.54	3.17	46.48
BDO IV	MET LIMIT 38.5oC	500 Watts	0%	0 days	38.54	3.18	26.14
BDO IV	MET LIMIT 38.5oC	500 Watts	2%	12 days	38.54	3.17	39.70
BDO IV	MET LIMIT 38.5oC	500 Watts	2%	8 days	38.53	3.16	34.86
BDO IV	MET LIMIT 38.5oC	500 Watts	2%	4 days	38.53	3.12	27.13
BDO IV	MET LIMIT 38.5oC	500 Watts	2%	0 days	38.53	3.11	14.53
BDO IV	MET LIMIT 38.5oC	500 Watts	4%	12 days	38.53	3.07	14.54
BDO IV	MET LIMIT 38.5oC	500 Watts	4%	8 days	38.53	3.08	10.66
BDO IV	MET LIMIT 38.5oC	500 Watts	4%	4 days	38.53	3.10	6.78
BDO IV	MET LIMIT 38.5oC	500 Watts	4%	0 days	38.53	3.11	2.91
BDO IV	MET LIMIT 38.5oC	500 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	500 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	500 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	500 Watts	6%	0 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	600 Watts	0%	12 days	38.53	3.12	44.56
BDO IV	MET LIMIT 38.5oC	600 Watts	0%	8 days	38.53	3.16	42.61
BDO IV	MET LIMIT 38.5oC	600 Watts	0%	4 days	38.54	3.17	36.80
BDO IV	MET LIMIT 38.5oC	600 Watts	0%	0 days	38.54	3.18	21.30
BDO IV	MET LIMIT 38.5oC	600 Watts	2%	12 days	38.54	3.17	30.99
BDO IV	MET LIMIT 38.5oC	600 Watts	2%	8 days	38.53	3.16	28.08
BDO IV	MET LIMIT 38.5oC	600 Watts	2%	4 days	38.53	3.12	22.28
BDO IV	MET LIMIT 38.5oC	600 Watts	2%	0 days	38.53	3.11	11.63
BDO IV	MET LIMIT 38.5oC	600 Watts	4%	12 days	38.53	3.07	11.63
BDO IV	MET LIMIT 38.5oC	600 Watts	4%	8 days	38.53	3.08	8.72
BDO IV	MET LIMIT 38.5oC	600 Watts	4%	4 days	38.53	3.10	5.81
BDO IV	MET LIMIT 38.5oC	600 Watts	4%	0 days	38.53	3.11	1.94
BDO IV	MET LIMIT 38.5oC	600 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	600 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	600 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38.5oC	600 Watts	6%	0 days	38.83	9.86	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDO IV	MET LIMIT 38oC	105 Watts	0%	12 days	37.26	0.00	100.00
BDO IV	MET LIMIT 38oC	105 Watts	0%	8 days	37.29	0.00	100.00
BDO IV	MET LIMIT 38oC	105 Watts	0%	4 days	37.40	0.00	100.00
BDO IV	MET LIMIT 38oC	105 Watts	0%	0 days	37.79	.05	99.95
BDO IV	MET LIMIT 38oC	105 Watts	2%	12 days	37.65	.02	99.98
BDO IV	MET LIMIT 38oC	105 Watts	2%	8 days	37.72	.03	99.97
BDO IV	MET LIMIT 38oC	105 Watts	2%	4 days	37.84	.07	99.93
BDO IV	MET LIMIT 38oC	105 Watts	2%	0 days	38.14	.43	99.57
BDO IV	MET LIMIT 38oC	105 Watts	4%	12 days	38.19	.59	99.41
BDO IV	MET LIMIT 38oC	105 Watts	4%	8 days	38.26	.85	99.15
BDO IV	MET LIMIT 38oC	105 Watts	4%	4 days	38.36	1.40	98.60
BDO IV	MET LIMIT 38oC	105 Watts	4%	0 days	38.48	2.52	97.48
BDO IV	MET LIMIT 38oC	105 Watts	6%	12 days	38.83	9.86	90.14
BDO IV	MET LIMIT 38oC	105 Watts	6%	8 days	38.83	9.86	90.14
BDO IV	MET LIMIT 38oC	105 Watts	6%	4 days	38.83	9.86	90.14
BDO IV	MET LIMIT 38oC	105 Watts	6%	0 days	38.83	9.86	90.14
BDO IV	MET LIMIT 38oC	150 Watts	0%	12 days	37.50	.01	99.99
BDO IV	MET LIMIT 38oC	150 Watts	0%	8 days	37.54	.01	99.99
BDO IV	MET LIMIT 38oC	150 Watts	0%	4 days	37.67	.02	99.98
BDO IV	MET LIMIT 38oC	150 Watts	0%	0 days	38.02	.22	84.81
BDO IV	MET LIMIT 38oC	150 Watts	2%	12 days	37.90	.11	99.89
BDO IV	MET LIMIT 38oC	150 Watts	2%	8 days	37.98	.17	99.83
BDO IV	MET LIMIT 38oC	150 Watts	2%	4 days	38.02	.22	72.84
BDO IV	MET LIMIT 38oC	150 Watts	2%	0 days	38.14	.43	0.00
BDO IV	MET LIMIT 38oC	150 Watts	4%	12 days	38.19	.59	0.00
BDO IV	MET LIMIT 38oC	150 Watts	4%	8 days	38.26	.85	0.00
BDO IV	MET LIMIT 38oC	150 Watts	4%	4 days	38.36	1.40	0.00
BDO IV	MET LIMIT 38oC	150 Watts	4%	0 days	38.48	2.52	0.00
BDO IV	MET LIMIT 38oC	150 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	150 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	150 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	150 Watts	6%	0 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	300 Watts	0%	12 days	38.02	.23	74.83
BDO IV	MET LIMIT 38oC	300 Watts	0%	8 days	38.02	.23	70.84
BDO IV	MET LIMIT 38oC	300 Watts	0%	4 days	38.03	.23	56.87
BDO IV	MET LIMIT 38oC	300 Watts	0%	0 days	38.02	.22	19.96
BDO IV	MET LIMIT 38oC	300 Watts	2%	12 days	38.02	.22	37.92
BDO IV	MET LIMIT 38oC	300 Watts	2%	8 days	38.02	.22	29.93
BDO IV	MET LIMIT 38oC	300 Watts	2%	4 days	38.02	.22	16.96
BDO IV	MET LIMIT 38oC	300 Watts	2%	0 days	38.14	.43	0.00
BDO IV	MET LIMIT 38oC	300 Watts	4%	12 days	38.19	.59	0.00
BDO IV	MET LIMIT 38oC	300 Watts	4%	8 days	38.26	.85	0.00
BDO IV	MET LIMIT 38oC	300 Watts	4%	4 days	38.36	1.40	0.00
BDO IV	MET LIMIT 38oC	300 Watts	4%	0 days	38.48	2.52	0.00
BDO IV	MET LIMIT 38oC	300 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	300 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	300 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	300 Watts	6%	0 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	400 Watts	0%	12 days	38.02	.23	49.89
BDO IV	MET LIMIT 38oC	400 Watts	0%	8 days	38.02	.23	46.89
BDO IV	MET LIMIT 38oC	400 Watts	0%	4 days	38.03	.23	36.91
BDO IV	MET LIMIT 38oC	400 Watts	0%	0 days	38.02	.22	12.97
BDO IV	MET LIMIT 38oC	400 Watts	2%	12 days	38.02	.22	24.95
BDO IV	MET LIMIT 38oC	400 Watts	2%	8 days	38.02	.22	19.96
BDO IV	MET LIMIT 38oC	400 Watts	2%	4 days	38.02	.22	10.98
BDO IV	MET LIMIT 38oC	400 Watts	2%	0 days	38.14	.43	0.00
BDO IV	MET LIMIT 38oC	400 Watts	4%	12 days	38.19	.59	0.00
BDO IV	MET LIMIT 38oC	400 Watts	4%	8 days	38.26	.85	0.00
BDO IV	MET LIMIT 38oC	400 Watts	4%	4 days	38.36	1.40	0.00
BDO IV	MET LIMIT 38oC	400 Watts	4%	0 days	38.48	2.52	0.00
BDO IV	MET LIMIT 38oC	400 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	400 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	400 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	400 Watts	6%	0 days	38.83	9.86	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDO IV	MET LIMIT 38oC	500 Watts	0%	12 days	38.02	.23	36.91
BDO IV	MET LIMIT 38oC	500 Watts	0%	8 days	38.02	.23	34.92
BDO IV	MET LIMIT 38oC	500 Watts	0%	4 days	38.03	.23	27.94
BDO IV	MET LIMIT 38oC	500 Watts	0%	0 days	38.02	.22	9.98
BDO IV	MET LIMIT 38oC	500 Watts	2%	12 days	38.02	.22	18.96
BDO IV	MET LIMIT 38oC	500 Watts	2%	8 days	38.02	.22	14.97
BDO IV	MET LIMIT 38oC	500 Watts	2%	4 days	38.02	.22	7.98
BDO IV	MET LIMIT 38oC	500 Watts	2%	0 days	38.14	.43	0.00
BDO IV	MET LIMIT 38oC	500 Watts	4%	12 days	38.19	.59	0.00
BDO IV	MET LIMIT 38oC	500 Watts	4%	8 days	38.26	.85	0.00
BDO IV	MET LIMIT 38oC	500 Watts	4%	4 days	38.36	1.40	0.00
BDO IV	MET LIMIT 38oC	500 Watts	4%	0 days	38.48	2.52	0.00
BDO IV	MET LIMIT 38oC	500 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	500 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	500 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	500 Watts	6%	0 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	600 Watts	0%	12 days	38.02	.23	29.93
BDO IV	MET LIMIT 38oC	600 Watts	0%	8 days	38.02	.23	27.94
BDO IV	MET LIMIT 38oC	600 Watts	0%	4 days	38.03	.23	21.95
BDO IV	MET LIMIT 38oC	600 Watts	0%	0 days	38.02	.22	7.98
BDO IV	MET LIMIT 38oC	600 Watts	2%	12 days	38.02	.22	14.97
BDO IV	MET LIMIT 38oC	600 Watts	2%	8 days	38.02	.22	11.97
BDO IV	MET LIMIT 38oC	600 Watts	2%	4 days	38.02	.22	6.98
BDO IV	MET LIMIT 38oC	600 Watts	2%	0 days	38.14	.43	0.00
BDO IV	MET LIMIT 38oC	600 Watts	4%	12 days	38.19	.59	0.00
BDO IV	MET LIMIT 38oC	600 Watts	4%	8 days	38.26	.85	0.00
BDO IV	MET LIMIT 38oC	600 Watts	4%	4 days	38.36	1.40	0.00
BDO IV	MET LIMIT 38oC	600 Watts	4%	0 days	38.48	2.52	0.00
BDO IV	MET LIMIT 38oC	600 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	600 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	600 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	MET LIMIT 38oC	600 Watts	6%	0 days	38.83	9.86	0.00
BDO IV	FM 21-40	105 Watts	0%	12 days	37.26	0.00	100.00
BDO IV	FM 21-40	105 Watts	0%	8 days	37.29	0.00	100.00
BDO IV	FM 21-40	105 Watts	0%	4 days	37.40	0.00	100.00
BDO IV	FM 21-40	105 Watts	0%	0 days	37.79	.05	99.95
BDO IV	FM 21-40	105 Watts	2%	12 days	37.65	.02	99.98
BDO IV	FM 21-40	105 Watts	2%	8 days	37.72	.03	99.97
BDO IV	FM 21-40	105 Watts	2%	4 days	37.84	.07	99.93
BDO IV	FM 21-40	105 Watts	2%	0 days	38.14	.43	99.57
BDO IV	FM 21-40	105 Watts	4%	12 days	38.19	.59	99.41
BDO IV	FM 21-40	105 Watts	4%	8 days	38.26	.85	99.15
BDO IV	FM 21-40	105 Watts	4%	4 days	38.36	1.40	98.60
BDO IV	FM 21-40	105 Watts	4%	0 days	38.48	2.52	97.48
BDO IV	FM 21-40	105 Watts	6%	12 days	38.83	9.86	90.14
BDO IV	FM 21-40	105 Watts	6%	8 days	38.83	9.86	90.14
BDO IV	FM 21-40	105 Watts	6%	4 days	38.83	9.86	90.14
BDO IV	FM 21-40	105 Watts	6%	0 days	38.83	9.86	90.14
BDO IV	FM 21-40	150 Watts	0%	12 days	37.35	0.00	29.00
BDO IV	FM 21-40	150 Watts	0%	8 days	37.38	0.00	29.00
BDO IV	FM 21-40	150 Watts	0%	4 days	37.30	.01	29.00
BDO IV	FM 21-40	150 Watts	0%	0 days	37.91	.11	28.97
BDO IV	FM 21-40	150 Watts	2%	12 days	37.74	.04	28.99
BDO IV	FM 21-40	150 Watts	2%	8 days	37.81	.06	28.98
BDO IV	FM 21-40	150 Watts	2%	4 days	37.95	.14	28.96
BDO IV	FM 21-40	150 Watts	2%	0 days	38.26	.83	28.76
BDO IV	FM 21-40	150 Watts	4%	12 days	38.30	1.04	28.70
BDO IV	FM 21-40	150 Watts	4%	8 days	38.37	1.49	28.57
BDO IV	FM 21-40	150 Watts	4%	4 days	38.47	2.38	28.31
BDO IV	FM 21-40	150 Watts	4%	0 days	38.60	4.21	27.78
BDO IV	FM 21-40	150 Watts	6%	12 days	38.95	14.48	24.80
BDO IV	FM 21-40	150 Watts	6%	8 days	38.95	14.48	24.80
BDO IV	FM 21-40	150 Watts	6%	4 days	38.95	14.48	24.80
BDO IV	FM 21-40	150 Watts	6%	0 days	38.95	14.48	24.80

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDO IV	FM 21-40	300 Watts	0%	12 days	37.26	0.00	0.00
BDO IV	FM 21-40	300 Watts	0%	8 days	37.29	0.00	0.00
BDO IV	FM 21-40	300 Watts	0%	4 days	37.40	0.00	0.00
BDO IV	FM 21-40	300 Watts	0%	0 days	37.79	.05	0.00
BDO IV	FM 21-40	300 Watts	2%	12 days	37.65	.02	0.00
BDO IV	FM 21-40	300 Watts	2%	8 days	37.72	.03	0.00
BDO IV	FM 21-40	300 Watts	2%	4 days	37.84	.07	0.00
BDO IV	FM 21-40	300 Watts	2%	0 days	38.14	.43	0.00
BDO IV	FM 21-40	300 Watts	4%	12 days	38.19	.59	0.00
BDO IV	FM 21-40	300 Watts	4%	8 days	38.26	.85	0.00
BDO IV	FM 21-40	300 Watts	4%	4 days	38.36	1.40	0.00
BDO IV	FM 21-40	300 Watts	4%	0 days	38.48	2.52	0.00
BDO IV	FM 21-40	300 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	FM 21-40	300 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	FM 21-40	300 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	FM 21-40	300 Watts	6%	0 days	38.83	9.86	0.00
BDO IV	FM 21-40	400 Watts	0%	12 days	37.26	0.00	0.00
BDO IV	FM 21-40	400 Watts	0%	8 days	37.29	0.00	0.00
BDO IV	FM 21-40	400 Watts	0%	4 days	37.40	0.00	0.00
BDO IV	FM 21-40	400 Watts	0%	0 days	37.79	.05	0.00
BDO IV	FM 21-40	400 Watts	2%	12 days	37.65	.02	0.00
BDO IV	FM 21-40	400 Watts	2%	8 days	37.72	.03	0.00
BDO IV	FM 21-40	400 Watts	2%	4 days	37.84	.07	0.00
BDO IV	FM 21-40	400 Watts	2%	0 days	38.14	.43	0.00
BDO IV	FM 21-40	400 Watts	4%	12 days	38.19	.59	0.00
BDO IV	FM 21-40	400 Watts	4%	8 days	38.26	.85	0.00
BDO IV	FM 21-40	400 Watts	4%	4 days	38.36	1.40	0.00
BDO IV	FM 21-40	400 Watts	4%	0 days	38.48	2.52	0.00
BDO IV	FM 21-40	400 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	FM 21-40	400 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	FM 21-40	400 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	FM 21-40	400 Watts	6%	0 days	38.83	9.86	0.00
BDO IV	FM 21-40	500 Watts	0%	12 days	37.26	0.00	0.00
BDO IV	FM 21-40	500 Watts	0%	8 days	37.29	0.00	0.00
BDO IV	FM 21-40	500 Watts	0%	4 days	37.40	0.00	0.00
BDO IV	FM 21-40	500 Watts	0%	0 days	37.79	.05	0.00
BDO IV	FM 21-40	500 Watts	2%	12 days	37.65	.02	0.00
BDO IV	FM 21-40	500 Watts	2%	8 days	37.72	.03	0.00
BDO IV	FM 21-40	500 Watts	2%	4 days	37.84	.07	0.00
BDO IV	FM 21-40	500 Watts	2%	0 days	38.14	.43	0.00
BDO IV	FM 21-40	500 Watts	4%	12 days	38.19	.59	0.00
BDO IV	FM 21-40	500 Watts	4%	8 days	38.26	.85	0.00
BDO IV	FM 21-40	500 Watts	4%	4 days	38.36	1.40	0.00
BDO IV	FM 21-40	500 Watts	4%	0 days	38.48	2.52	0.00
BDO IV	FM 21-40	500 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	FM 21-40	500 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	FM 21-40	500 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	FM 21-40	500 Watts	6%	0 days	38.83	9.86	0.00
BDO IV	FM 21-40	600 Watts	0%	12 days	37.26	0.00	0.00
BDO IV	FM 21-40	600 Watts	0%	8 days	37.29	0.00	0.00
BDO IV	FM 21-40	600 Watts	0%	4 days	37.40	0.00	0.00
BDO IV	FM 21-40	600 Watts	0%	0 days	37.79	.05	0.00
BDO IV	FM 21-40	600 Watts	2%	12 days	37.65	.02	0.00
BDO IV	FM 21-40	600 Watts	2%	8 days	37.72	.03	0.00
BDO IV	FM 21-40	600 Watts	2%	4 days	37.84	.07	0.00
BDO IV	FM 21-40	600 Watts	2%	0 days	38.14	.43	0.00
BDO IV	FM 21-40	600 Watts	4%	12 days	38.19	.59	0.00
BDO IV	FM 21-40	600 Watts	4%	8 days	38.26	.85	0.00
BDO IV	FM 21-40	600 Watts	4%	4 days	38.36	1.40	0.00
BDO IV	FM 21-40	600 Watts	4%	0 days	38.48	2.52	0.00
BDO IV	FM 21-40	600 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	FM 21-40	600 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	FM 21-40	600 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	FM 21-40	600 Watts	6%	0 days	38.83	9.86	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDO IV	FM 21-10 VARIANT	105 Watts	0%	12 days	37.26	0.00	100.00
BDO IV	FM 21-10 VARIANT	105 Watts	0%	8 days	37.29	0.00	100.00
BDO IV	FM 21-10 VARIANT	105 Watts	0%	4 days	37.40	0.00	100.00
BDO IV	FM 21-10 VARIANT	105 Watts	0%	0 days	37.79	.05	99.95
BDO IV	FM 21-10 VARIANT	105 Watts	2%	12 days	37.65	.02	99.98
BDO IV	FM 21-10 VARIANT	105 Watts	2%	8 days	37.72	.03	99.97
BDO IV	FM 21-10 VARIANT	105 Watts	2%	4 days	37.84	.07	99.93
BDO IV	FM 21-10 VARIANT	105 Watts	2%	0 days	38.14	.43	99.57
BDO IV	FM 21-10 VARIANT	105 Watts	4%	12 days	38.19	.59	99.41
BDO IV	FM 21-10 VARIANT	105 Watts	4%	8 days	38.26	.85	99.15
BDO IV	FM 21-10 VARIANT	105 Watts	4%	4 days	38.36	1.40	98.60
BDO IV	FM 21-10 VARIANT	105 Watts	4%	0 days	38.48	2.52	97.48
BDO IV	FM 21-10 VARIANT	105 Watts	6%	12 days	38.83	9.86	90.14
BDO IV	FM 21-10 VARIANT	105 Watts	6%	8 days	38.83	9.86	90.14
BDO IV	FM 21-10 VARIANT	105 Watts	6%	4 days	38.83	9.86	90.14
BDO IV	FM 21-10 VARIANT	105 Watts	6%	0 days	38.83	9.86	90.14
BDO IV	FM 21-10 VARIANT	150 Watts	0%	12 days	37.39	0.00	93.00
BDO IV	FM 21-10 VARIANT	150 Watts	0%	8 days	37.43	0.00	93.00
BDO IV	FM 21-10 VARIANT	150 Watts	0%	4 days	37.55	.01	92.99
BDO IV	FM 21-10 VARIANT	150 Watts	0%	0 days	37.94	.13	92.88
BDO IV	FM 21-10 VARIANT	150 Watts	2%	12 days	37.79	.05	92.95
BDO IV	FM 21-10 VARIANT	150 Watts	2%	8 days	37.86	.08	92.93
BDO IV	FM 21-10 VARIANT	150 Watts	2%	4 days	38.00	.19	92.82
BDO IV	FM 21-10 VARIANT	150 Watts	2%	0 days	38.28	.96	92.11
BDO IV	FM 21-10 VARIANT	150 Watts	4%	12 days	38.34	1.31	91.78
BDO IV	FM 21-10 VARIANT	150 Watts	4%	8 days	38.42	1.87	91.26
BDO IV	FM 21-10 VARIANT	150 Watts	4%	4 days	38.51	2.85	90.35
BDO IV	FM 21-10 VARIANT	150 Watts	4%	0 days	38.63	4.70	88.63
BDO IV	FM 21-10 VARIANT	150 Watts	6%	12 days	38.98	15.69	78.41
BDO IV	FM 21-10 VARIANT	150 Watts	6%	8 days	38.98	15.69	78.41
BDO IV	FM 21-10 VARIANT	150 Watts	6%	4 days	38.98	15.69	78.41
BDO IV	FM 21-10 VARIANT	150 Watts	6%	0 days	38.98	15.69	78.41
BDO IV	FM 21-10 VARIANT	300 Watts	0%	12 days	38.16	.50	92.54
BDO IV	FM 21-10 VARIANT	300 Watts	0%	8 days	38.21	.67	92.38
BDO IV	FM 21-10 VARIANT	300 Watts	0%	4 days	38.39	1.65	91.47
BDO IV	FM 21-10 VARIANT	300 Watts	0%	0 days	38.97	15.41	78.67
BDO IV	FM 21-10 VARIANT	300 Watts	2%	12 days	38.58	3.87	89.40
BDO IV	FM 21-10 VARIANT	300 Watts	2%	8 days	38.68	5.84	87.57
BDO IV	FM 21-10 VARIANT	300 Watts	2%	4 days	38.90	12.29	81.57
BDO IV	FM 21-10 VARIANT	300 Watts	2%	0 days	39.32	36.27	59.27
BDO IV	FM 21-10 VARIANT	300 Watts	4%	12 days	39.24	31.10	64.08
BDO IV	FM 21-10 VARIANT	300 Watts	4%	8 days	39.36	39.05	56.68
BDO IV	FM 21-10 VARIANT	300 Watts	4%	4 days	39.49	49.35	47.10
BDO IV	FM 21-10 VARIANT	300 Watts	4%	0 days	39.66	62.41	34.96
BDO IV	FM 21-10 VARIANT	300 Watts	6%	12 days	40.01	83.74	15.12
BDO IV	FM 21-10 VARIANT	300 Watts	6%	8 days	40.01	83.74	15.12
BDO IV	FM 21-10 VARIANT	300 Watts	6%	4 days	40.01	83.74	15.12
BDO IV	FM 21-10 VARIANT	300 Watts	6%	0 days	40.01	83.74	15.12
BDO IV	FM 21-10 VARIANT	400 Watts	0%	12 days	38.77	7.91	85.64
BDO IV	FM 21-10 VARIANT	400 Watts	0%	8 days	38.83	9.90	83.79
BDO IV	FM 21-10 VARIANT	400 Watts	0%	4 days	39.04	19.06	75.27
BDO IV	FM 21-10 VARIANT	400 Watts	0%	0 days	39.75	68.64	29.16
BDO IV	FM 21-10 VARIANT	400 Watts	2%	12 days	39.20	28.37	66.62
BDO IV	FM 21-10 VARIANT	400 Watts	2%	8 days	39.33	36.91	58.67
BDO IV	FM 21-10 VARIANT	400 Watts	2%	4 days	39.58	56.27	40.67
BDO IV	FM 21-10 VARIANT	400 Watts	2%	0 days	40.10	87.56	11.57
BDO IV	FM 21-10 VARIANT	400 Watts	4%	12 days	39.93	79.54	19.03
BDO IV	FM 21-10 VARIANT	400 Watts	4%	8 days	40.07	86.15	12.88
BDO IV	FM 21-10 VARIANT	400 Watts	4%	4 days	40.24	92.24	7.22
BDO IV	FM 21-10 VARIANT	400 Watts	4%	0 days	40.45	96.57	3.19
BDO IV	FM 21-10 VARIANT	400 Watts	6%	12 days	40.79	99.36	.60
BDO IV	FM 21-10 VARIANT	400 Watts	6%	8 days	40.79	99.36	.60
BDO IV	FM 21-10 VARIANT	400 Watts	6%	4 days	40.79	99.36	.60
BDO IV	FM 21-10 VARIANT	400 Watts	6%	0 days	40.79	99.36	.60

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDO IV	FM 21-10 VARIANT	500 Watts	0%	12 days	39.47	48.03	48.33
BDO IV	FM 21-10 VARIANT	500 Watts	0%	8 days	39.55	53.71	43.05
BDO IV	FM 21-10 VARIANT	500 Watts	0%	4 days	39.80	71.55	26.46
BDO IV	FM 21-10 VARIANT	500 Watts	0%	0 days	40.63	98.55	1.35
BDO IV	FM 21-10 VARIANT	500 Watts	2%	12 days	39.92	79.28	19.27
BDO IV	FM 21-10 VARIANT	500 Watts	2%	8 days	40.07	86.24	12.80
BDO IV	FM 21-10 VARIANT	500 Watts	2%	4 days	40.36	95.16	4.50
BDO IV	FM 21-10 VARIANT	500 Watts	2%	0 days	40.98	99.78	.20
BDO IV	FM 21-10 VARIANT	500 Watts	4%	12 days	40.71	99.00	.93
BDO IV	FM 21-10 VARIANT	500 Watts	4%	8 days	40.87	99.58	.39
BDO IV	FM 21-10 VARIANT	500 Watts	4%	4 days	41.07	99.87	.12
BDO IV	FM 21-10 VARIANT	500 Watts	4%	0 days	41.33	99.98	.02
BDO IV	FM 21-10 VARIANT	500 Watts	6%	12 days	41.68	100.00	0.00
BDO IV	FM 21-10 VARIANT	500 Watts	6%	8 days	41.68	100.00	0.00
BDO IV	FM 21-10 VARIANT	500 Watts	6%	4 days	41.68	100.00	0.00
BDO IV	FM 21-10 VARIANT	500 Watts	6%	0 days	41.68	100.00	0.00
BDO IV	FM 21-10 VARIANT	600 Watts	0%	12 days	40.34	94.69	4.94
BDO IV	FM 21-10 VARIANT	600 Watts	0%	8 days	40.42	96.21	3.52
BDO IV	FM 21-10 VARIANT	600 Watts	0%	4 days	40.70	98.96	.97
BDO IV	FM 21-10 VARIANT	600 Watts	0%	0 days	41.65	100.00	0.00
BDO IV	FM 21-10 VARIANT	600 Watts	2%	12 days	40.80	99.39	.57
BDO IV	FM 21-10 VARIANT	600 Watts	2%	8 days	40.96	99.76	.22
BDO IV	FM 21-10 VARIANT	600 Watts	2%	4 days	41.30	99.97	.03
BDO IV	FM 21-10 VARIANT	600 Watts	2%	0 days	42.00	100.00	0.00
BDO IV	FM 21-10 VARIANT	600 Watts	4%	12 days	41.64	100.00	0.00
BDO IV	FM 21-10 VARIANT	600 Watts	4%	8 days	41.82	100.00	0.00
BDO IV	FM 21-10 VARIANT	600 Watts	4%	4 days	42.05	100.00	0.00
BDO IV	FM 21-10 VARIANT	600 Watts	4%	0 days	42.35	100.00	0.00
BDO IV	FM 21-10 VARIANT	600 Watts	6%	12 days	42.69	100.00	0.00
BDO IV	FM 21-10 VARIANT	600 Watts	6%	8 days	42.69	100.00	0.00
BDO IV	FM 21-10 VARIANT	600 Watts	6%	4 days	42.69	100.00	0.00
BDO IV	FM 21-10 VARIANT	600 Watts	6%	0 days	42.69	100.00	0.00
BDO IV	FM 21-40 VARIANT	105 Watts	0%	12 days	37.26	0.00	100.00
BDO IV	FM 21-40 VARIANT	105 Watts	0%	8 days	37.29	0.00	100.00
BDO IV	FM 21-40 VARIANT	105 Watts	0%	4 days	37.40	0.00	100.00
BDO IV	FM 21-40 VARIANT	105 Watts	0%	0 days	37.79	.05	99.95
BDO IV	FM 21-40 VARIANT	105 Watts	2%	12 days	37.65	.02	99.98
BDO IV	FM 21-40 VARIANT	105 Watts	2%	8 days	37.72	.03	99.97
BDO IV	FM 21-40 VARIANT	105 Watts	2%	4 days	37.84	.07	99.93
BDO IV	FM 21-40 VARIANT	105 Watts	2%	0 days	38.14	.43	99.57
BDO IV	FM 21-40 VARIANT	105 Watts	4%	12 days	38.19	.59	99.41
BDO IV	FM 21-40 VARIANT	105 Watts	4%	8 days	38.26	.85	99.15
BDO IV	FM 21-40 VARIANT	105 Watts	4%	4 days	38.36	1.40	98.60
BDO IV	FM 21-40 VARIANT	105 Watts	4%	0 days	38.48	2.52	97.48
BDO IV	FM 21-40 VARIANT	105 Watts	6%	12 days	38.83	9.86	90.14
BDO IV	FM 21-40 VARIANT	105 Watts	6%	8 days	38.83	9.86	90.14
BDO IV	FM 21-40 VARIANT	105 Watts	6%	4 days	38.83	9.86	90.14
BDO IV	FM 21-40 VARIANT	105 Watts	6%	0 days	38.83	9.86	90.14
BDO IV	FM 21-40 VARIANT	150 Watts	0%	12 days	37.37	0.00	38.00
BDO IV	FM 21-40 VARIANT	150 Watts	0%	8 days	37.41	0.00	38.00
BDO IV	FM 21-40 VARIANT	150 Watts	0%	4 days	37.52	.01	38.00
BDO IV	FM 21-40 VARIANT	150 Watts	0%	0 days	37.91	.11	37.96
BDO IV	FM 21-40 VARIANT	150 Watts	2%	12 days	37.77	.04	37.98
BDO IV	FM 21-40 VARIANT	150 Watts	2%	8 days	37.83	.07	37.97
BDO IV	FM 21-40 VARIANT	150 Watts	2%	4 days	37.97	.16	37.94
BDO IV	FM 21-40 VARIANT	150 Watts	2%	0 days	38.25	.83	37.68
BDO IV	FM 21-40 VARIANT	150 Watts	4%	12 days	38.32	1.15	37.56
BDO IV	FM 21-40 VARIANT	150 Watts	4%	8 days	38.39	1.63	37.38
BDO IV	FM 21-40 VARIANT	150 Watts	4%	4 days	38.48	2.50	37.05
BDO IV	FM 21-40 VARIANT	150 Watts	4%	0 days	38.61	4.19	36.41
BDO IV	FM 21-40 VARIANT	150 Watts	6%	12 days	38.95	14.41	32.52
BDO IV	FM 21-40 VARIANT	150 Watts	6%	8 days	38.95	14.41	32.52
BDO IV	FM 21-40 VARIANT	150 Watts	6%	4 days	38.95	14.41	32.52
BDO IV	FM 21-40 VARIANT	150 Watts	6%	0 days	38.95	14.41	32.52

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDO IV	FM 21-40 VARIANT	300 Watts	0%	12 days	37.69	.02	17.00
BDO IV	FM 21-40 VARIANT	300 Watts	0%	8 days	37.73	.03	16.99
BDO IV	FM 21-40 VARIANT	300 Watts	0%	4 days	37.97	.09	16.98
BDO IV	FM 21-40 VARIANT	300 Watts	0%	0 days	38.37	1.48	16.75
BDO IV	FM 21-40 VARIANT	300 Watts	2%	12 days	38.09	.34	16.94
BDO IV	FM 21-40 VARIANT	300 Watts	2%	8 days	38.18	.55	16.91
BDO IV	FM 21-40 VARIANT	300 Watts	2%	4 days	38.35	1.35	16.77
BDO IV	FM 21-40 VARIANT	300 Watts	2%	0 days	38.72	6.56	15.88
BDO IV	FM 21-40 VARIANT	300 Watts	4%	12 days	38.70	6.14	15.96
BDO IV	FM 21-40 VARIANT	300 Watts	4%	8 days	38.79	8.62	15.53
BDO IV	FM 21-40 VARIANT	300 Watts	4%	4 days	38.91	12.80	14.82
BDO IV	FM 21-40 VARIANT	300 Watts	4%	0 days	39.06	19.98	13.60
BDO IV	FM 21-40 VARIANT	300 Watts	6%	12 days	39.41	43.06	9.68
BDO IV	FM 21-40 VARIANT	300 Watts	6%	8 days	39.41	43.06	9.68
BDO IV	FM 21-40 VARIANT	300 Watts	6%	4 days	39.41	43.06	9.68
BDO IV	FM 21-40 VARIANT	300 Watts	6%	0 days	39.41	43.06	9.68
BDO IV	FM 21-40 VARIANT	400 Watts	0%	12 days	37.98	.17	16.97
BDO IV	FM 21-40 VARIANT	400 Watts	0%	8 days	38.03	.24	16.96
BDO IV	FM 21-40 VARIANT	400 Watts	0%	4 days	38.20	.61	16.90
BDO IV	FM 21-40 VARIANT	400 Watts	0%	0 days	38.76	7.83	15.67
BDO IV	FM 21-40 VARIANT	400 Watts	2%	12 days	38.40	1.69	16.71
BDO IV	FM 21-40 VARIANT	400 Watts	2%	8 days	38.49	2.63	16.55
BDO IV	FM 21-40 VARIANT	400 Watts	2%	4 days	38.69	5.99	15.98
BDO IV	FM 21-40 VARIANT	400 Watts	2%	0 days	39.11	22.68	13.14
BDO IV	FM 21-40 VARIANT	400 Watts	4%	12 days	39.04	18.70	13.82
BDO IV	FM 21-40 VARIANT	400 Watts	4%	8 days	39.14	24.69	12.80
BDO IV	FM 21-40 VARIANT	400 Watts	4%	4 days	39.28	33.68	11.27
BDO IV	FM 21-40 VARIANT	400 Watts	4%	0 days	39.46	46.72	9.06
BDO IV	FM 21-40 VARIANT	400 Watts	6%	12 days	39.80	72.06	4.75
BDO IV	FM 21-40 VARIANT	400 Watts	6%	8 days	39.80	72.06	4.75
BDO IV	FM 21-40 VARIANT	400 Watts	6%	4 days	39.80	72.06	4.75
BDO IV	FM 21-40 VARIANT	400 Watts	6%	0 days	39.80	72.06	4.75
BDO IV	FM 21-40 VARIANT	500 Watts	0%	12 days	37.26	0.00	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	0%	8 days	37.29	0.00	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	0%	4 days	37.40	0.00	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	0%	0 days	37.79	.05	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	2%	12 days	37.65	.02	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	2%	8 days	37.72	.03	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	2%	4 days	37.84	.07	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	2%	0 days	38.14	.43	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	4%	12 days	38.19	.59	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	4%	8 days	38.26	.85	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	4%	4 days	38.36	1.40	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	4%	0 days	38.48	2.52	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	FM 21-40 VARIANT	500 Watts	6%	0 days	38.83	9.86	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	0%	12 days	37.26	0.00	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	0%	8 days	37.29	0.00	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	0%	4 days	37.40	0.00	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	0%	0 days	37.79	.05	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	2%	12 days	37.65	.02	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	2%	8 days	37.72	.03	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	2%	4 days	37.84	.07	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	2%	0 days	38.14	.43	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	4%	12 days	38.19	.59	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	4%	8 days	38.26	.85	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	4%	4 days	38.36	1.40	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	4%	0 days	38.48	2.52	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	6%	12 days	38.83	9.86	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	6%	8 days	38.83	9.86	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	6%	4 days	38.83	9.86	0.00
BDO IV	FM 21-40 VARIANT	600 Watts	6%	0 days	38.83	9.86	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU+BDO IV	NONE	105 Watts	0%	12 days	37.55	.01	99.99
BDU+BDO IV	NONE	105 Watts	0%	8 days	37.59	.01	99.99
BDU+BDO IV	NONE	105 Watts	0%	4 days	37.70	.03	99.97
BDU+BDO IV	NONE	105 Watts	0%	0 days	38.09	.32	99.68
BDU+BDO IV	NONE	105 Watts	2%	12 days	37.95	.14	99.86
BDU+BDO IV	NONE	105 Watts	2%	8 days	38.02	.22	99.78
BDU+BDO IV	NONE	105 Watts	2%	4 days	38.15	.48	99.52
BDU+BDO IV	NONE	105 Watts	2%	0 days	38.43	2.00	98.00
BDU+BDO IV	NONE	105 Watts	4%	12 days	38.50	2.71	97.29
BDU+BDO IV	NONE	105 Watts	4%	8 days	38.57	3.70	96.30
BDU+BDO IV	NONE	105 Watts	4%	4 days	38.66	5.36	94.64
BDU+BDO IV	NONE	105 Watts	4%	0 days	38.78	8.27	91.73
BDU+BDO IV	NONE	105 Watts	6%	12 days	39.13	23.60	76.40
BDU+BDO IV	NONE	105 Watts	6%	8 days	39.13	23.60	76.40
BDU+BDO IV	NONE	105 Watts	6%	4 days	39.13	23.60	76.40
BDU+BDO IV	NONE	105 Watts	6%	0 days	39.13	23.60	76.40
BDU+BDO IV	NONE	150 Watts	0%	12 days	37.86	.08	99.92
BDU+BDO IV	NONE	150 Watts	0%	8 days	37.90	.10	99.90
BDU+BDO IV	NONE	150 Watts	0%	4 days	38.03	.24	99.76
BDU+BDO IV	NONE	150 Watts	0%	0 days	38.47	2.42	97.58
BDU+BDO IV	NONE	150 Watts	2%	12 days	38.26	.87	99.13
BDU+BDO IV	NONE	150 Watts	2%	8 days	38.34	1.28	98.72
BDU+BDO IV	NONE	150 Watts	2%	4 days	38.50	2.69	97.31
BDU+BDO IV	NONE	150 Watts	2%	0 days	38.82	9.58	90.42
BDU+BDO IV	NONE	150 Watts	4%	12 days	38.84	10.36	89.64
BDU+BDO IV	NONE	150 Watts	4%	8 days	38.93	13.54	86.46
BDU+BDO IV	NONE	150 Watts	4%	4 days	39.03	18.48	81.52
BDU+BDO IV	NONE	150 Watts	4%	0 days	39.17	26.16	73.84
BDU+BDO IV	NONE	150 Watts	6%	12 days	39.52	51.16	48.84
BDU+BDO IV	NONE	150 Watts	6%	8 days	39.52	51.16	48.84
BDU+BDO IV	NONE	150 Watts	6%	4 days	39.52	51.16	48.84
BDU+BDO IV	NONE	150 Watts	6%	0 days	39.52	51.16	48.84
BDU+BDO IV	NONE	300 Watts	0%	12 days	39.13	23.60	76.40
BDU+BDO IV	NONE	300 Watts	0%	8 days	39.18	27.04	72.96
BDU+BDO IV	NONE	300 Watts	0%	4 days	39.37	39.92	60.08
BDU+BDO IV	NONE	300 Watts	0%	0 days	39.98	82.32	17.68
BDU+BDO IV	NONE	300 Watts	2%	12 days	39.55	53.88	46.12
BDU+BDO IV	NONE	300 Watts	2%	8 days	39.66	61.92	38.08
BDU+BDO IV	NONE	300 Watts	2%	4 days	39.88	76.62	23.38
BDU+BDO IV	NONE	300 Watts	2%	0 days	40.33	94.47	5.53
BDU+BDO IV	NONE	300 Watts	4%	12 days	40.22	91.83	8.17
BDU+BDO IV	NONE	300 Watts	4%	8 days	40.34	94.71	5.29
BDU+BDO IV	NONE	300 Watts	4%	4 days	40.49	97.14	2.86
BDU+BDO IV	NONE	300 Watts	4%	0 days	40.68	98.82	1.18
BDU+BDO IV	NONE	300 Watts	6%	12 days	41.02	99.83	.17
BDU+BDO IV	NONE	300 Watts	6%	8 days	41.02	99.83	.17
BDU+BDO IV	NONE	300 Watts	6%	4 days	41.02	99.83	.17
BDU+BDO IV	NONE	300 Watts	6%	0 days	41.02	99.83	.17
BDU+BDO IV	NONE	400 Watts	0%	12 days	40.30	93.79	6.21
BDU+BDO IV	NONE	400 Watts	0%	8 days	40.36	95.16	4.84
BDU+BDO IV	NONE	400 Watts	0%	4 days	40.58	98.08	1.92
BDU+BDO IV	NONE	400 Watts	0%	0 days	41.28	99.97	.03
BDU+BDO IV	NONE	400 Watts	2%	12 days	40.74	99.13	.87
BDU+BDO IV	NONE	400 Watts	2%	8 days	40.86	99.55	.45
BDU+BDO IV	NONE	400 Watts	2%	4 days	41.11	99.90	.10
BDU+BDO IV	NONE	400 Watts	2%	0 days	41.63	100.00	0.00
BDU+BDO IV	NONE	400 Watts	4%	12 days	41.46	99.99	.01
BDU+BDO IV	NONE	400 Watts	4%	8 days	41.59	100.00	0.00
BDU+BDO IV	NONE	400 Watts	4%	4 days	41.76	100.00	0.00
BDU+BDO IV	NONE	400 Watts	4%	0 days	41.98	100.00	0.00
BDU+BDO IV	NONE	400 Watts	6%	12 days	42.32	100.00	0.00
BDU+BDO IV	NONE	400 Watts	6%	8 days	42.32	100.00	0.00
BDU+BDO IV	NONE	400 Watts	6%	4 days	42.32	100.00	0.00
BDU+BDO IV	NONE	400 Watts	6%	0 days	42.32	100.00	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU+BDO IV	NONE	500 Watts	0%	12 days	41.92	100.00	0.00
BDU+BDO IV	NONE	500 Watts	0%	8 days	41.99	100.00	0.00
BDU+BDO IV	NONE	500 Watts	0%	4 days	42.22	100.00	0.00
BDU+BDO IV	NONE	500 Watts	0%	0 days	42.99	100.00	0.00
BDU+BDO IV	NONE	500 Watts	2%	12 days	42.36	100.00	0.00
BDU+BDO IV	NONE	500 Watts	2%	8 days	42.50	100.00	0.00
BDU+BDO IV	NONE	500 Watts	2%	4 days	42.77	100.00	0.00
BDU+BDO IV	NONE	500 Watts	2%	0 days	43.34	100.00	0.00
BDU+BDO IV	NONE	500 Watts	4%	12 days	43.12	100.00	0.00
BDU+BDO IV	NONE	500 Watts	4%	8 days	43.26	100.00	0.00
BDU+BDO IV	NONE	500 Watts	4%	4 days	43.45	100.00	0.00
BDU+BDO IV	NONE	500 Watts	4%	0 days	43.69	100.00	0.00
BDU+BDO IV	NONE	500 Watts	6%	12 days	44.03	100.00	0.00
BDU+BDO IV	NONE	500 Watts	6%	8 days	44.03	100.00	0.00
BDU+BDO IV	NONE	500 Watts	6%	4 days	44.03	100.00	0.00
BDU+BDO IV	NONE	500 Watts	6%	0 days	44.03	100.00	0.00
BDU+BDO IV	NONE	600 Watts	0%	12 days	44.24	100.00	0.00
BDU+BDO IV	NONE	600 Watts	0%	8 days	44.32	100.00	0.00
BDU+BDO IV	NONE	600 Watts	0%	4 days	44.56	100.00	0.00
BDU+BDO IV	NONE	600 Watts	0%	0 days	45.37	100.00	0.00
BDU+BDO IV	NONE	600 Watts	2%	12 days	44.69	100.00	0.00
BDU+BDO IV	NONE	600 Watts	2%	8 days	44.83	100.00	0.00
BDU+BDO IV	NONE	600 Watts	2%	4 days	45.12	100.00	0.00
BDU+BDO IV	NONE	600 Watts	2%	0 days	45.72	100.00	0.00
BDU+BDO IV	NONE	600 Watts	4%	12 days	45.47	100.00	0.00
BDU+BDO IV	NONE	600 Watts	4%	8 days	45.62	100.00	0.00
BDU+BDO IV	NONE	600 Watts	4%	4 days	45.82	100.00	0.00
BDU+BDO IV	NONE	600 Watts	4%	0 days	46.07	100.00	0.00
BDU+BDO IV	NONE	600 Watts	6%	12 days	46.41	100.00	0.00
BDU+BDO IV	NONE	600 Watts	6%	8 days	46.41	100.00	0.00
BDU+BDO IV	NONE	600 Watts	6%	4 days	46.41	100.00	0.00
BDU+BDO IV	NONE	600 Watts	6%	0 days	46.41	100.00	0.00
BDU+BDO IV	FM 21-10	105 Watts	0%	12 days	37.55	.01	99.99
BDU+BDO IV	FM 21-10	105 Watts	0%	8 days	37.59	.01	99.99
BDU+BDO IV	FM 21-10	105 Watts	0%	4 days	37.70	.03	99.97
BDU+BDO IV	FM 21-10	105 Watts	0%	0 days	38.09	.32	99.68
BDU+BDO IV	FM 21-10	105 Watts	2%	12 days	37.95	.14	99.86
BDU+BDO IV	FM 21-10	105 Watts	2%	8 days	38.02	.22	99.78
BDU+BDO IV	FM 21-10	105 Watts	2%	4 days	38.15	.48	99.52
BDU+BDO IV	FM 21-10	105 Watts	2%	0 days	38.43	2.00	98.00
BDU+BDO IV	FM 21-10	105 Watts	4%	12 days	38.50	2.71	97.29
BDU+BDO IV	FM 21-10	105 Watts	4%	8 days	38.57	3.70	96.30
BDU+BDO IV	FM 21-10	105 Watts	4%	4 days	38.66	5.36	94.64
BDU+BDO IV	FM 21-10	105 Watts	4%	0 days	38.78	8.27	91.73
BDU+BDO IV	FM 21-10	105 Watts	6%	12 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-10	105 Watts	6%	8 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-10	105 Watts	6%	4 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-10	105 Watts	6%	0 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-10	150 Watts	0%	12 days	37.68	.02	32.99
BDU+BDO IV	FM 21-10	150 Watts	0%	8 days	37.71	.03	32.99
BDU+BDO IV	FM 21-10	150 Watts	0%	4 days	37.84	.07	32.98
BDU+BDO IV	FM 21-10	150 Watts	0%	0 days	38.25	.79	32.74
BDU+BDO IV	FM 21-10	150 Watts	2%	12 days	38.08	.31	32.90
BDU+BDO IV	FM 21-10	150 Watts	2%	8 days	38.15	.46	32.85
BDU+BDO IV	FM 21-10	150 Watts	2%	4 days	38.29	1.02	32.66
BDU+BDO IV	FM 21-10	150 Watts	2%	0 days	38.59	4.05	31.66
BDU+BDO IV	FM 21-10	150 Watts	4%	12 days	38.64	4.94	31.37
BDU+BDO IV	FM 21-10	150 Watts	4%	8 days	38.72	6.64	30.81
BDU+BDO IV	FM 21-10	150 Watts	4%	4 days	38.82	9.41	29.89
BDU+BDO IV	FM 21-10	150 Watts	4%	0 days	38.94	14.05	28.36
BDU+BDO IV	FM 21-10	150 Watts	6%	12 days	39.29	34.08	21.75
BDU+BDO IV	FM 21-10	150 Watts	6%	8 days	39.29	34.08	21.75
BDU+BDO IV	FM 21-10	150 Watts	6%	4 days	39.29	34.08	21.75
BDU+BDO IV	FM 21-10	150 Watts	6%	0 days	39.29	34.08	21.75

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU+BDO IV	FM 21-10	300 Watts	0%	12 days	38.32	1.14	32.62
BDU+BDO IV	FM 21-10	300 Watts	0%	8 days	38.36	1.44	32.52
BDU+BDO IV	FM 21-10	300 Watts	0%	4 days	38.52	3.03	32.00
BDU+BDO IV	FM 21-10	300 Watts	0%	0 days	39.07	20.22	26.33
BDU+BDO IV	FM 21-10	300 Watts	2%	12 days	38.73	6.91	30.72
BDU+BDO IV	FM 21-10	300 Watts	2%	8 days	38.82	9.61	29.83
BDU+BDO IV	FM 21-10	300 Watts	2%	4 days	39.01	17.48	27.23
BDU+BDO IV	FM 21-10	300 Watts	2%	0 days	39.41	43.40	18.68
BDU+BDO IV	FM 21-10	300 Watts	4%	12 days	39.36	39.45	19.98
BDU+BDO IV	FM 21-10	300 Watts	4%	8 days	39.46	47.16	17.44
BDU+BDO IV	FM 21-10	300 Watts	4%	4 days	39.59	57.14	14.14
BDU+BDO IV	FM 21-10	300 Watts	4%	0 days	39.76	69.20	10.16
BDU+BDO IV	FM 21-10	300 Watts	6%	12 days	40.11	87.88	4.00
BDU+BDO IV	FM 21-10	300 Watts	6%	8 days	40.11	87.88	4.00
BDU+BDO IV	FM 21-10	300 Watts	6%	4 days	40.11	87.88	4.00
BDU+BDO IV	FM 21-10	300 Watts	6%	0 days	40.11	87.88	4.00
BDU+BDO IV	FM 21-10	400 Watts	0%	12 days	38.82	9.41	29.89
BDU+BDO IV	FM 21-10	400 Watts	0%	8 days	38.86	11.02	29.36
BDU+BDO IV	FM 21-10	400 Watts	0%	4 days	39.04	18.74	26.82
BDU+BDO IV	FM 21-10	400 Watts	0%	0 days	39.64	60.83	12.93
BDU+BDO IV	FM 21-10	400 Watts	2%	12 days	39.23	30.08	23.07
BDU+BDO IV	FM 21-10	400 Watts	2%	8 days	39.33	37.27	20.70
BDU+BDO IV	FM 21-10	400 Watts	2%	4 days	39.54	53.38	15.38
BDU+BDO IV	FM 21-10	400 Watts	2%	0 days	39.99	82.70	5.71
BDU+BDO IV	FM 21-10	400 Watts	4%	12 days	39.89	77.41	7.45
BDU+BDO IV	FM 21-10	400 Watts	4%	8 days	40.00	83.42	5.47
BDU+BDO IV	FM 21-10	400 Watts	4%	4 days	40.15	89.45	3.48
BDU+BDO IV	FM 21-10	400 Watts	4%	0 days	40.34	94.63	1.77
BDU+BDO IV	FM 21-10	400 Watts	6%	12 days	40.68	98.86	.38
BDU+BDO IV	FM 21-10	400 Watts	6%	8 days	40.68	98.86	.38
BDU+BDO IV	FM 21-10	400 Watts	6%	4 days	40.68	98.86	.38
BDU+BDO IV	FM 21-10	400 Watts	6%	0 days	40.68	98.86	.38
BDU+BDO IV	FM 21-10	500 Watts	0%	12 days	39.34	37.58	20.60
BDU+BDO IV	FM 21-10	500 Watts	0%	8 days	39.38	41.24	19.39
BDU+BDO IV	FM 21-10	500 Watts	0%	4 days	39.55	53.90	15.21
BDU+BDO IV	FM 21-10	500 Watts	0%	0 days	40.17	90.23	3.22
BDU+BDO IV	FM 21-10	500 Watts	2%	12 days	39.75	68.56	10.38
BDU+BDO IV	FM 21-10	500 Watts	2%	8 days	39.85	74.78	8.32
BDU+BDO IV	FM 21-10	500 Watts	2%	4 days	40.06	85.77	4.70
BDU+BDO IV	FM 21-10	500 Watts	2%	0 days	40.52	97.51	.82
BDU+BDO IV	FM 21-10	500 Watts	4%	12 days	40.40	95.89	1.36
BDU+BDO IV	FM 21-10	500 Watts	4%	8 days	40.52	97.53	.82
BDU+BDO IV	FM 21-10	500 Watts	4%	4 days	40.67	98.80	.40
BDU+BDO IV	FM 21-10	500 Watts	4%	0 days	40.87	99.57	.14
BDU+BDO IV	FM 21-10	500 Watts	6%	12 days	41.21	99.95	.02
BDU+BDO IV	FM 21-10	500 Watts	6%	8 days	41.21	99.95	.02
BDU+BDO IV	FM 21-10	500 Watts	6%	4 days	41.21	99.95	.02
BDU+BDO IV	FM 21-10	500 Watts	6%	0 days	41.21	99.95	.02
BDU+BDO IV	FM 21-10	600 Watts	0%	12 days	39.88	76.78	7.66
BDU+BDO IV	FM 21-10	600 Watts	0%	8 days	39.93	79.54	6.75
BDU+BDO IV	FM 21-10	600 Watts	0%	4 days	40.09	87.25	4.21
BDU+BDO IV	FM 21-10	600 Watts	0%	0 days	40.67	98.79	.40
BDU+BDO IV	FM 21-10	600 Watts	2%	12 days	40.29	93.69	2.08
BDU+BDO IV	FM 21-10	600 Watts	2%	8 days	40.39	95.64	1.44
BDU+BDO IV	FM 21-10	600 Watts	2%	4 days	40.58	98.15	.61
BDU+BDO IV	FM 21-10	600 Watts	2%	0 days	41.02	99.83	.06
BDU+BDO IV	FM 21-10	600 Watts	4%	12 days	40.93	99.70	.10
BDU+BDO IV	FM 21-10	600 Watts	4%	8 days	41.04	99.84	.05
BDU+BDO IV	FM 21-10	600 Watts	4%	4 days	41.18	99.94	.02
BDU+BDO IV	FM 21-10	600 Watts	4%	0 days	41.37	99.98	.01
BDU+BDO IV	FM 21-10	600 Watts	6%	12 days	41.71	100.00	0.00
BDU+BDO IV	FM 21-10	600 Watts	6%	8 days	41.71	100.00	0.00
BDU+BDO IV	FM 21-10	600 Watts	6%	4 days	41.71	100.00	0.00
BDU+BDO IV	FM 21-10	600 Watts	6%	0 days	41.71	100.00	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU+BDO IV	MET LIMIT 39oC	105 Watts	0%	12 days	37.55	.01	99.99
BDU+BDO IV	MET LIMIT 39oC	105 Watts	0%	8 days	37.59	.01	99.99
BDU+BDO IV	MET LIMIT 39oC	105 Watts	0%	4 days	37.70	.03	99.97
BDU+BDO IV	MET LIMIT 39oC	105 Watts	0%	0 days	38.09	.32	99.68
BDU+BDO IV	MET LIMIT 39oC	105 Watts	2%	12 days	37.95	.14	99.86
BDU+BDO IV	MET LIMIT 39oC	105 Watts	2%	8 days	38.02	.22	99.78
BDU+BDO IV	MET LIMIT 39oC	105 Watts	2%	4 days	38.15	.48	99.52
BDU+BDO IV	MET LIMIT 39oC	105 Watts	2%	0 days	38.43	2.00	98.00
BDU+BDO IV	MET LIMIT 39oC	105 Watts	4%	12 days	38.50	2.71	97.29
BDU+BDO IV	MET LIMIT 39oC	105 Watts	4%	8 days	38.57	3.70	96.30
BDU+BDO IV	MET LIMIT 39oC	105 Watts	4%	4 days	38.66	5.36	94.64
BDU+BDO IV	MET LIMIT 39oC	105 Watts	4%	0 days	38.78	8.27	91.73
BDU+BDO IV	MET LIMIT 39oC	105 Watts	6%	12 days	39.13	23.60	76.40
BDU+BDO IV	MET LIMIT 39oC	105 Watts	6%	8 days	39.13	23.60	76.40
BDU+BDO IV	MET LIMIT 39oC	105 Watts	6%	4 days	39.13	23.60	76.40
BDU+BDO IV	MET LIMIT 39oC	105 Watts	6%	0 days	39.13	23.60	76.40
BDU+BDO IV	MET LIMIT 39oC	150 Watts	0%	12 days	37.86	.08	99.92
BDU+BDO IV	MET LIMIT 39oC	150 Watts	0%	8 days	37.90	.10	99.90
BDU+BDO IV	MET LIMIT 39oC	150 Watts	0%	4 days	38.03	.24	99.76
BDU+BDO IV	MET LIMIT 39oC	150 Watts	0%	0 days	38.47	2.42	97.58
BDU+BDO IV	MET LIMIT 39oC	150 Watts	2%	12 days	38.26	.87	99.13
BDU+BDO IV	MET LIMIT 39oC	150 Watts	2%	8 days	38.34	1.28	98.72
BDU+BDO IV	MET LIMIT 39oC	150 Watts	2%	4 days	38.50	2.69	97.31
BDU+BDO IV	MET LIMIT 39oC	150 Watts	2%	0 days	38.82	9.58	90.42
BDU+BDO IV	MET LIMIT 39oC	150 Watts	4%	12 days	38.84	10.36	89.64
BDU+BDO IV	MET LIMIT 39oC	150 Watts	4%	8 days	38.93	13.54	86.46
BDU+BDO IV	MET LIMIT 39oC	150 Watts	4%	4 days	39.00	16.87	82.30
BDU+BDO IV	MET LIMIT 39oC	150 Watts	4%	0 days	39.00	16.93	72.27
BDU+BDO IV	MET LIMIT 39oC	150 Watts	6%	12 days	39.09	21.24	8.19
BDU+BDO IV	MET LIMIT 39oC	150 Watts	6%	8 days	39.09	21.24	8.19
BDU+BDO IV	MET LIMIT 39oC	150 Watts	6%	4 days	39.09	21.24	8.19
BDU+BDO IV	MET LIMIT 39oC	150 Watts	6%	0 days	39.09	21.24	8.19
BDU+BDO IV	MET LIMIT 39oC	300 Watts	0%	12 days	39.00	16.88	81.46
BDU+BDO IV	MET LIMIT 39oC	300 Watts	0%	8 days	39.02	17.74	78.97
BDU+BDO IV	MET LIMIT 39oC	300 Watts	0%	4 days	39.04	18.68	71.56
BDU+BDO IV	MET LIMIT 39oC	300 Watts	0%	0 days	39.04	18.74	49.57
BDU+BDO IV	MET LIMIT 39oC	300 Watts	2%	12 days	39.04	18.64	61.83
BDU+BDO IV	MET LIMIT 39oC	300 Watts	2%	8 days	39.01	17.11	56.37
BDU+BDO IV	MET LIMIT 39oC	300 Watts	2%	4 days	39.04	18.88	49.48
BDU+BDO IV	MET LIMIT 39oC	300 Watts	2%	0 days	39.04	18.92	34.05
BDU+BDO IV	MET LIMIT 39oC	300 Watts	4%	12 days	39.04	18.88	32.45
BDU+BDO IV	MET LIMIT 39oC	300 Watts	4%	8 days	39.04	18.93	28.37
BDU+BDO IV	MET LIMIT 39oC	300 Watts	4%	4 days	39.04	19.02	23.48
BDU+BDO IV	MET LIMIT 39oC	300 Watts	4%	0 days	39.04	18.65	17.90
BDU+BDO IV	MET LIMIT 39oC	300 Watts	6%	12 days	39.09	21.24	1.89
BDU+BDO IV	MET LIMIT 39oC	300 Watts	6%	8 days	39.09	21.24	1.89
BDU+BDO IV	MET LIMIT 39oC	300 Watts	6%	4 days	39.09	21.24	1.89
BDU+BDO IV	MET LIMIT 39oC	300 Watts	6%	0 days	39.09	21.24	1.89
BDU+BDO IV	MET LIMIT 39oC	400 Watts	0%	12 days	39.09	21.24	51.19
BDU+BDO IV	MET LIMIT 39oC	400 Watts	0%	8 days	39.04	18.74	52.01
BDU+BDO IV	MET LIMIT 39oC	400 Watts	0%	4 days	39.04	18.68	47.17
BDU+BDO IV	MET LIMIT 39oC	400 Watts	0%	0 days	39.04	18.74	32.50
BDU+BDO IV	MET LIMIT 39oC	400 Watts	2%	12 days	39.04	18.87	40.57
BDU+BDO IV	MET LIMIT 39oC	400 Watts	2%	8 days	39.01	17.11	37.30
BDU+BDO IV	MET LIMIT 39oC	400 Watts	2%	4 days	39.04	18.88	32.45
BDU+BDO IV	MET LIMIT 39oC	400 Watts	2%	0 days	39.04	18.92	22.70
BDU+BDO IV	MET LIMIT 39oC	400 Watts	4%	12 days	39.04	18.64	21.15
BDU+BDO IV	MET LIMIT 39oC	400 Watts	4%	8 days	39.04	18.93	18.65
BDU+BDO IV	MET LIMIT 39oC	400 Watts	4%	4 days	39.04	19.02	15.39
BDU+BDO IV	MET LIMIT 39oC	400 Watts	4%	0 days	39.04	18.65	11.39
BDU+BDO IV	MET LIMIT 39oC	400 Watts	6%	12 days	39.09	21.24	1.26
BDU+BDO IV	MET LIMIT 39oC	400 Watts	6%	8 days	39.09	21.24	1.26
BDU+BDO IV	MET LIMIT 39oC	400 Watts	6%	4 days	39.09	21.24	1.26
BDU+BDO IV	MET LIMIT 39oC	400 Watts	6%	0 days	39.09	21.24	1.26

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU+BDO IV	MET LIMIT 39oC	500 Watts	0%	12 days	39.04	18.87	38.94
BDU+BDO IV	MET LIMIT 39oC	500 Watts	0%	8 days	39.04	18.74	39.00
BDU+BDO IV	MET LIMIT 39oC	500 Watts	0%	4 days	39.04	18.68	34.97
BDU+BDO IV	MET LIMIT 39oC	500 Watts	0%	0 days	39.04	18.74	24.38
BDU+BDO IV	MET LIMIT 39oC	500 Watts	2%	12 days	39.04	18.64	30.10
BDU+BDO IV	MET LIMIT 39oC	500 Watts	2%	8 days	39.01	17.11	27.35
BDU+BDO IV	MET LIMIT 39oC	500 Watts	2%	4 days	39.04	18.88	24.34
BDU+BDO IV	MET LIMIT 39oC	500 Watts	2%	0 days	39.04	18.92	17.03
BDU+BDO IV	MET LIMIT 39oC	500 Watts	4%	12 days	39.04	18.88	16.22
BDU+BDO IV	MET LIMIT 39oC	500 Watts	4%	8 days	39.04	18.93	13.78
BDU+BDO IV	MET LIMIT 39oC	500 Watts	4%	4 days	39.04	19.02	11.34
BDU+BDO IV	MET LIMIT 39oC	500 Watts	4%	0 days	39.04	18.65	8.95
BDU+BDO IV	MET LIMIT 39oC	500 Watts	6%	12 days	39.09	21.24	.95
BDU+BDO IV	MET LIMIT 39oC	500 Watts	6%	8 days	39.09	21.24	.95
BDU+BDO IV	MET LIMIT 39oC	500 Watts	6%	4 days	39.09	21.24	.95
BDU+BDO IV	MET LIMIT 39oC	500 Watts	6%	0 days	39.09	21.24	.95
BDU+BDO IV	MET LIMIT 39oC	600 Watts	0%	12 days	39.04	18.87	31.64
BDU+BDO IV	MET LIMIT 39oC	600 Watts	0%	8 days	39.04	18.74	30.07
BDU+BDO IV	MET LIMIT 39oC	600 Watts	0%	4 days	39.04	18.68	27.65
BDU+BDO IV	MET LIMIT 39oC	600 Watts	0%	0 days	39.04	18.74	21.94
BDU+BDO IV	MET LIMIT 39oC	600 Watts	2%	12 days	39.04	18.64	24.41
BDU+BDO IV	MET LIMIT 39oC	600 Watts	2%	8 days	39.04	18.88	21.09
BDU+BDO IV	MET LIMIT 39oC	600 Watts	2%	4 days	39.04	18.88	19.47
BDU+BDO IV	MET LIMIT 39oC	600 Watts	2%	0 days	39.04	18.92	13.78
BDU+BDO IV	MET LIMIT 39oC	600 Watts	4%	12 days	39.04	18.88	12.98
BDU+BDO IV	MET LIMIT 39oC	600 Watts	4%	8 days	39.04	18.93	11.35
BDU+BDO IV	MET LIMIT 39oC	600 Watts	4%	4 days	39.04	19.02	8.91
BDU+BDO IV	MET LIMIT 39oC	600 Watts	4%	0 days	39.04	18.65	7.32
BDU+BDO IV	MET LIMIT 39oC	600 Watts	6%	12 days	39.09	21.24	.71
BDU+BDO IV	MET LIMIT 39oC	600 Watts	6%	8 days	39.09	21.24	.71
BDU+BDO IV	MET LIMIT 39oC	600 Watts	6%	4 days	39.09	21.24	.71
BDU+BDO IV	MET LIMIT 39oC	600 Watts	6%	0 days	39.09	21.24	.71
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	0%	12 days	37.55	.01	99.99
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	0%	8 days	37.59	.01	99.99
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	0%	4 days	37.70	.03	99.97
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	0%	0 days	38.09	.32	99.68
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	2%	12 days	37.95	.14	99.86
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	2%	8 days	38.02	.22	99.78
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	2%	4 days	38.15	.48	99.52
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	2%	0 days	38.43	2.00	98.00
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	4%	12 days	38.50	2.71	97.29
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	4%	8 days	38.57	3.70	96.30
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	4%	4 days	38.66	5.36	94.64
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	4%	0 days	38.78	8.27	91.73
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	6%	12 days	39.13	23.60	76.40
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	6%	8 days	39.13	23.60	76.40
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	6%	4 days	39.13	23.60	76.40
BDU+BDO IV	MET LIMIT 38.5oC	105 Watts	6%	0 days	39.13	23.60	76.40
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	0%	12 days	37.86	.08	99.92
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	0%	8 days	37.90	.10	99.90
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	0%	4 days	38.03	.24	99.76
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	0%	0 days	38.47	2.42	97.58
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	2%	12 days	38.26	.87	99.13
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	2%	8 days	38.34	1.28	98.72
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	2%	4 days	38.50	2.69	97.31
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	2%	0 days	38.53	3.10	51.36
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	4%	12 days	38.53	3.11	29.07
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	4%	8 days	38.53	3.13	14.53
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	4%	4 days	38.62	4.58	4.20
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	4%	0 days	39.12	23.34	0.00
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	6%	12 days	39.47	47.60	0.00
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	6%	8 days	39.47	47.60	0.00
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	6%	4 days	39.47	47.60	0.00
BDU+BDO IV	MET LIMIT 38.5oC	150 Watts	6%	0 days	39.47	47.60	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	0%	12 days	38.53	3.08	69.78
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	0%	8 days	38.53	3.09	65.90
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	0%	4 days	38.53	3.08	57.18
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	0%	0 days	38.54	3.18	31.95
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	2%	12 days	38.53	3.10	42.64
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	2%	8 days	38.53	3.10	38.76
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	2%	4 days	38.53	3.07	29.08
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	2%	0 days	38.53	3.10	11.63
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	4%	12 days	38.53	3.11	6.78
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	4%	8 days	38.53	3.13	3.29
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	4%	4 days	38.62	4.58	.95
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	4%	0 days	38.74	7.14	0.00
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	6%	12 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	6%	8 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	6%	4 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	300 Watts	6%	0 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	0%	12 days	38.53	3.08	45.55
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	0%	8 days	38.53	3.09	43.61
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	0%	4 days	38.53	3.08	37.80
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	0%	0 days	38.54	3.18	21.30
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	2%	12 days	38.53	3.10	28.10
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	2%	8 days	38.53	3.10	25.19
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	2%	4 days	38.53	3.07	19.39
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	2%	0 days	38.53	3.10	7.75
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	4%	12 days	38.53	3.11	4.36
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	4%	8 days	38.53	3.13	0.00
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	4%	4 days	38.62	4.58	.67
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	4%	0 days	38.74	7.14	0.00
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	6%	12 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	6%	8 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	6%	4 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	400 Watts	6%	0 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	0%	12 days	38.53	3.08	34.89
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	0%	8 days	38.53	3.09	32.95
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	0%	4 days	38.53	3.08	28.11
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	0%	0 days	38.54	3.18	15.49
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	2%	12 days	38.53	3.10	21.32
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	2%	8 days	38.53	3.10	19.38
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	2%	4 days	38.53	3.07	14.54
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	2%	0 days	38.53	3.10	5.81
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	4%	12 days	38.53	3.11	3.29
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	4%	8 days	38.53	3.13	1.65
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	4%	4 days	38.62	4.58	.48
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	4%	0 days	38.74	7.14	0.00
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	6%	12 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	6%	8 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	6%	4 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	500 Watts	6%	0 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	0%	12 days	38.53	3.08	28.11
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	0%	8 days	38.53	3.09	26.17
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	0%	4 days	38.53	3.08	22.29
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	0%	0 days	38.54	3.18	12.59
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	2%	12 days	38.53	3.10	17.44
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	2%	8 days	38.53	3.10	15.50
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	2%	4 days	38.53	3.07	11.63
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	2%	0 days	38.53	3.10	4.65
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	4%	12 days	38.53	3.11	2.62
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	4%	8 days	38.53	3.13	1.26
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	4%	4 days	38.62	4.58	.38
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	4%	0 days	38.74	7.14	0.00
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	6%	12 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	6%	8 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	6%	4 days	39.09	21.24	0.00
BDU+BDO IV	MET LIMIT 38.5oC	600 Watts	6%	0 days	39.09	21.24	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU+BDO IV	MET LIMIT 38oC	105 Watts	0%	12 days	37.55	.01	99.99
BDU+BDO IV	MET LIMIT 38oC	105 Watts	0%	8 days	37.59	.01	99.99
BDU+BDO IV	MET LIMIT 38oC	105 Watts	0%	4 days	37.70	.03	99.97
BDU+BDO IV	MET LIMIT 38oC	105 Watts	0%	0 days	38.09	.32	99.68
BDU+BDO IV	MET LIMIT 38oC	105 Watts	2%	12 days	37.95	.14	99.86
BDU+BDO IV	MET LIMIT 38oC	105 Watts	2%	8 days	38.02	.22	99.78
BDU+BDO IV	MET LIMIT 38oC	105 Watts	2%	4 days	38.15	.48	99.52
BDU+BDO IV	MET LIMIT 38oC	105 Watts	2%	0 days	38.43	2.00	98.00
BDU+BDO IV	MET LIMIT 38oC	105 Watts	4%	12 days	38.50	2.71	97.29
BDU+BDO IV	MET LIMIT 38oC	105 Watts	4%	8 days	38.57	3.70	96.30
BDU+BDO IV	MET LIMIT 38oC	105 Watts	4%	4 days	38.66	5.36	94.64
BDU+BDO IV	MET LIMIT 38oC	105 Watts	4%	0 days	38.78	8.27	91.73
BDU+BDO IV	MET LIMIT 38oC	105 Watts	6%	12 days	39.13	23.60	76.40
BDU+BDO IV	MET LIMIT 38oC	105 Watts	6%	8 days	39.13	23.60	76.40
BDU+BDO IV	MET LIMIT 38oC	105 Watts	6%	4 days	39.13	23.60	76.40
BDU+BDO IV	MET LIMIT 38oC	105 Watts	6%	0 days	39.13	23.60	76.40
BDU+BDO IV	MET LIMIT 38oC	150 Watts	0%	12 days	37.86	.08	99.92
BDU+BDO IV	MET LIMIT 38oC	150 Watts	0%	8 days	37.90	.10	99.90
BDU+BDO IV	MET LIMIT 38oC	150 Watts	0%	4 days	38.00	.20	98.80
BDU+BDO IV	MET LIMIT 38oC	150 Watts	0%	0 days	38.04	.25	18.95
BDU+BDO IV	MET LIMIT 38oC	150 Watts	2%	12 days	38.02	.22	39.91
BDU+BDO IV	MET LIMIT 38oC	150 Watts	2%	8 days	38.02	.22	0.00
BDU+BDO IV	MET LIMIT 38oC	150 Watts	2%	4 days	38.15	.48	0.00
BDU+BDO IV	MET LIMIT 38oC	150 Watts	2%	0 days	38.43	2.00	0.00
BDU+BDO IV	MET LIMIT 38oC	150 Watts	4%	12 days	38.50	2.71	0.00
BDU+BDO IV	MET LIMIT 38oC	150 Watts	4%	8 days	38.57	3.70	0.00
BDU+BDO IV	MET LIMIT 38oC	150 Watts	4%	4 days	38.66	5.36	0.00
BDU+BDO IV	MET LIMIT 38oC	150 Watts	4%	0 days	38.78	8.27	0.00
BDU+BDO IV	MET LIMIT 38oC	150 Watts	6%	12 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	150 Watts	6%	8 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	150 Watts	6%	4 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	150 Watts	6%	0 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	300 Watts	0%	12 days	38.02	.22	37.92
BDU+BDO IV	MET LIMIT 38oC	300 Watts	0%	8 days	38.02	.23	35.92
BDU+BDO IV	MET LIMIT 38oC	300 Watts	0%	4 days	38.04	.22	26.94
BDU+BDO IV	MET LIMIT 38oC	300 Watts	0%	0 days	38.04	.25	4.29
BDU+BDO IV	MET LIMIT 38oC	300 Watts	2%	12 days	38.02	.22	8.98
BDU+BDO IV	MET LIMIT 38oC	300 Watts	2%	8 days	38.02	.22	0.00
BDU+BDO IV	MET LIMIT 38oC	300 Watts	2%	4 days	38.15	.48	0.00
BDU+BDO IV	MET LIMIT 38oC	300 Watts	2%	0 days	38.43	2.00	0.00
BDU+BDO IV	MET LIMIT 38oC	300 Watts	4%	12 days	38.50	2.71	0.00
BDU+BDO IV	MET LIMIT 38oC	300 Watts	4%	8 days	38.57	3.70	0.00
BDU+BDO IV	MET LIMIT 38oC	300 Watts	4%	4 days	38.66	5.36	0.00
BDU+BDO IV	MET LIMIT 38oC	300 Watts	4%	0 days	38.78	8.27	0.00
BDU+BDO IV	MET LIMIT 38oC	300 Watts	6%	12 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	300 Watts	6%	8 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	300 Watts	6%	4 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	300 Watts	6%	0 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	400 Watts	0%	12 days	38.02	.22	24.95
BDU+BDO IV	MET LIMIT 38oC	400 Watts	0%	8 days	38.02	.23	23.94
BDU+BDO IV	MET LIMIT 38oC	400 Watts	0%	4 days	38.02	.22	17.96
BDU+BDO IV	MET LIMIT 38oC	400 Watts	0%	0 days	38.04	.25	2.79
BDU+BDO IV	MET LIMIT 38oC	400 Watts	2%	12 days	38.02	.22	6.09
BDU+BDO IV	MET LIMIT 38oC	400 Watts	2%	8 days	38.02	.22	0.00
BDU+BDO IV	MET LIMIT 38oC	400 Watts	2%	4 days	38.15	.48	0.00
BDU+BDO IV	MET LIMIT 38oC	400 Watts	2%	0 days	38.43	2.00	0.00
BDU+BDO IV	MET LIMIT 38oC	400 Watts	4%	12 days	38.50	2.71	0.00
BDU+BDO IV	MET LIMIT 38oC	400 Watts	4%	8 days	38.57	3.70	0.00
BDU+BDO IV	MET LIMIT 38oC	400 Watts	4%	4 days	38.66	5.36	0.00
BDU+BDO IV	MET LIMIT 38oC	400 Watts	4%	0 days	38.78	8.27	0.00
BDU+BDO IV	MET LIMIT 38oC	400 Watts	6%	12 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	400 Watts	6%	8 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	400 Watts	6%	4 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	400 Watts	6%	0 days	39.13	23.60	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU+BDO IV	MET LIMIT 38oC	500 Watts	0%	12 days	38.02	.22	18.96
BDU+BDO IV	MET LIMIT 38oC	500 Watts	0%	8 days	38.02	.23	17.96
BDU+BDO IV	MET LIMIT 38oC	500 Watts	0%	4 days	38.02	.22	12.97
BDU+BDO IV	MET LIMIT 38oC	500 Watts	0%	0 days	38.04	.25	2.09
BDU+BDO IV	MET LIMIT 38oC	500 Watts	2%	12 days	38.02	.22	4.59
BDU+BDO IV	MET LIMIT 38oC	500 Watts	2%	8 days	38.02	.22	0.00
BDU+BDO IV	MET LIMIT 38oC	500 Watts	2%	4 days	38.02	.22	0.00
BDU+BDO IV	MET LIMIT 38oC	500 Watts	2%	0 days	38.43	2.00	0.00
BDU+BDO IV	MET LIMIT 38oC	500 Watts	4%	12 days	38.50	2.71	0.00
BDU+BDO IV	MET LIMIT 38oC	500 Watts	4%	8 days	38.57	3.70	0.00
BDU+BDO IV	MET LIMIT 38oC	500 Watts	4%	4 days	38.66	5.26	0.00
BDU+BDO IV	MET LIMIT 38oC	500 Watts	4%	0 days	38.78	8.27	0.00
BDU+BDO IV	MET LIMIT 38oC	500 Watts	6%	12 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	500 Watts	6%	8 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	500 Watts	6%	4 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	500 Watts	6%	0 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	600 Watts	0%	12 days	38.02	.22	14.97
BDU+BDO IV	MET LIMIT 38oC	600 Watts	0%	8 days	38.02	.23	13.97
BDU+BDO IV	MET LIMIT 38oC	600 Watts	0%	4 days	38.02	.22	10.98
BDU+BDO IV	MET LIMIT 38oC	600 Watts	0%	0 days	38.04	.25	1.70
BDU+BDO IV	MET LIMIT 38oC	600 Watts	2%	12 days	38.02	.22	3.59
BDU+BDO IV	MET LIMIT 38oC	600 Watts	2%	8 days	38.02	.22	0.00
BDU+BDO IV	MET LIMIT 38oC	600 Watts	2%	4 days	38.15	.48	0.00
BDU+BDO IV	MET LIMIT 38oC	600 Watts	2%	0 days	38.43	2.00	0.00
BDU+BDO IV	MET LIMIT 38oC	600 Watts	4%	12 days	38.50	2.71	0.00
BDU+BDO IV	MET LIMIT 38oC	600 Watts	4%	8 days	38.57	3.70	0.00
BDU+BDO IV	MET LIMIT 38oC	600 Watts	4%	4 days	38.66	5.36	0.00
BDU+BDO IV	MET LIMIT 38oC	600 Watts	4%	0 days	38.78	8.27	0.00
BDU+BDO IV	MET LIMIT 38oC	600 Watts	6%	12 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	600 Watts	6%	8 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	600 Watts	6%	4 days	39.13	23.60	0.00
BDU+BDO IV	MET LIMIT 38oC	600 Watts	6%	0 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	105 Watts	0%	12 days	37.55	.01	99.99
BDU+BDO IV	FM 21-40	105 Watts	0%	8 days	37.59	.01	99.99
BDU+BDO IV	FM 21-40	105 Watts	0%	4 days	37.70	.03	99.97
BDU+BDO IV	FM 21-40	105 Watts	0%	0 days	38.09	.32	99.68
BDU+BDO IV	FM 21-40	105 Watts	2%	12 days	37.95	.14	99.86
BDU+BDO IV	FM 21-40	105 Watts	2%	8 days	38.02	.22	99.78
BDU+BDO IV	FM 21-40	105 Watts	2%	4 days	38.15	.48	99.52
BDU+BDO IV	FM 21-40	105 Watts	2%	0 days	38.43	2.00	98.00
BDU+BDO IV	FM 21-40	105 Watts	4%	12 days	38.50	2.71	97.29
BDU+BDO IV	FM 21-40	105 Watts	4%	8 days	38.57	3.70	96.30
BDU+BDO IV	FM 21-40	105 Watts	4%	4 days	38.66	5.36	94.64
BDU+BDO IV	FM 21-40	105 Watts	4%	0 days	38.78	8.27	91.73
BDU+BDO IV	FM 21-40	105 Watts	6%	12 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-40	105 Watts	6%	8 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-40	105 Watts	6%	4 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-40	105 Watts	6%	0 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-40	150 Watts	0%	12 days	37.67	.02	28.99
BDU+BDO IV	FM 21-40	150 Watts	0%	8 days	37.71	.03	28.99
BDU+BDO IV	FM 21-40	150 Watts	0%	4 days	37.83	.07	28.98
BDU+BDO IV	FM 21-40	150 Watts	0%	0 days	38.24	.76	28.78
BDU+BDO IV	FM 21-40	150 Watts	2%	12 days	38.07	.30	28.91
BDU+BDO IV	FM 21-40	150 Watts	2%	8 days	38.14	.45	28.87
BDU+BDO IV	FM 21-40	150 Watts	2%	4 days	38.29	.98	28.72
BDU+BDO IV	FM 21-40	150 Watts	2%	0 days	38.58	3.91	27.87
BDU+BDO IV	FM 21-40	150 Watts	4%	12 days	38.63	4.79	27.61
BDU+BDO IV	FM 21-40	150 Watts	4%	8 days	38.71	6.45	27.13
BDU+BDO IV	FM 21-40	150 Watts	4%	4 days	38.81	9.16	26.34
BDU+BDO IV	FM 21-40	150 Watts	4%	0 days	38.93	13.70	25.03
BDU+BDO IV	FM 21-40	150 Watts	6%	12 days	39.28	33.49	19.29
BDU+BDO IV	FM 21-40	150 Watts	6%	8 days	39.28	33.49	19.29
BDU+BDO IV	FM 21-40	150 Watts	6%	4 days	39.28	33.49	19.29
BDU+BDO IV	FM 21-40	150 Watts	6%	0 days	39.28	33.49	19.29

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU+BDO IV	FM 21-40	300 Watts	0%	12 days	37.55	.01	0.00
BDU+BDO IV	FM 21-40	300 Watts	0%	8 days	37.59	.01	0.00
BDU+BDO IV	FM 21-40	300 Watts	0%	4 days	37.70	.03	0.00
BDU+BDO IV	FM 21-40	300 Watts	0%	0 days	38.09	.32	0.00
BDU+BDO IV	FM 21-40	300 Watts	2%	12 days	37.95	.14	0.00
BDU+BDO IV	FM 21-40	300 Watts	2%	8 days	38.02	.22	0.00
BDU+BDO IV	FM 21-40	300 Watts	2%	4 days	38.15	.48	0.00
BDU+BDO IV	FM 21-40	300 Watts	2%	0 days	38.43	2.00	0.00
BDU+BDO IV	FM 21-40	300 Watts	4%	12 days	38.50	2.71	0.00
BDU+BDO IV	FM 21-40	300 Watts	4%	8 days	38.57	3.70	0.00
BDU+BDO IV	FM 21-40	300 Watts	4%	4 days	38.66	5.36	0.00
BDU+BDO IV	FM 21-40	300 Watts	4%	0 days	38.78	8.27	0.00
BDU+BDO IV	FM 21-40	300 Watts	6%	12 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	300 Watts	6%	8 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	300 Watts	6%	4 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	300 Watts	6%	0 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	400 Watts	0%	12 days	37.55	.01	0.00
BDU+BDO IV	FM 21-40	400 Watts	0%	8 days	37.59	.01	0.00
BDU+BDO IV	FM 21-40	400 Watts	0%	4 days	37.70	.03	0.00
BDU+BDO IV	FM 21-40	400 Watts	0%	0 days	38.09	.32	0.00
BDU+BDO IV	FM 21-40	400 Watts	2%	12 days	37.95	.14	0.00
BDU+BDO IV	FM 21-40	400 Watts	2%	8 days	38.02	.22	0.00
BDU+BDO IV	FM 21-40	400 Watts	2%	4 days	38.15	.48	0.00
BDU+BDO IV	FM 21-40	400 Watts	2%	0 days	38.43	2.00	0.00
BDU+BDO IV	FM 21-40	400 Watts	4%	12 days	38.50	2.71	0.00
BDU+BDO IV	FM 21-40	400 Watts	4%	8 days	38.57	3.70	0.00
BDU+BDO IV	FM 21-40	400 Watts	4%	4 days	38.66	5.36	0.00
BDU+BDO IV	FM 21-40	400 Watts	4%	0 days	38.78	8.27	0.00
BDU+BDO IV	FM 21-40	400 Watts	6%	12 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	400 Watts	6%	8 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	400 Watts	6%	4 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	400 Watts	6%	0 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	500 Watts	0%	12 days	37.55	.01	0.00
BDU+BDO IV	FM 21-40	500 Watts	0%	8 days	37.59	.01	0.00
BDU+BDO IV	FM 21-40	500 Watts	0%	4 days	37.70	.03	0.00
BDU+BDO IV	FM 21-40	500 Watts	0%	0 days	38.09	.32	0.00
BDU+BDO IV	FM 21-40	500 Watts	2%	12 days	37.95	.14	0.00
BDU+BDO IV	FM 21-40	500 Watts	2%	8 days	38.02	.22	0.00
BDU+BDO IV	FM 21-40	500 Watts	2%	4 days	38.15	.48	0.00
BDU+BDO IV	FM 21-40	500 Watts	2%	0 days	38.43	2.00	0.00
BDU+BDO IV	FM 21-40	500 Watts	4%	12 days	38.50	2.71	0.00
BDU+BDO IV	FM 21-40	500 Watts	4%	8 days	38.57	3.70	0.00
BDU+BDO IV	FM 21-40	500 Watts	4%	4 days	38.66	5.36	0.00
BDU+BDO IV	FM 21-40	500 Watts	4%	0 days	38.78	8.27	0.00
BDU+BDO IV	FM 21-40	500 Watts	6%	12 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	500 Watts	6%	8 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	500 Watts	6%	4 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	500 Watts	6%	0 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	600 Watts	0%	12 days	37.55	.01	0.00
BDU+BDO IV	FM 21-40	600 Watts	0%	8 days	37.59	.01	0.00
BDU+BDO IV	FM 21-40	600 Watts	0%	4 days	37.70	.03	0.00
BDU+BDO IV	FM 21-40	600 Watts	0%	0 days	38.09	.32	0.00
BDU+BDO IV	FM 21-40	600 Watts	2%	12 days	37.95	.14	0.00
BDU+BDO IV	FM 21-40	600 Watts	2%	8 days	38.02	.22	0.00
BDU+BDO IV	FM 21-40	600 Watts	2%	4 days	38.15	.48	0.00
BDU+BDO IV	FM 21-40	600 Watts	2%	0 days	38.43	2.00	0.00
BDU+BDO IV	FM 21-40	600 Watts	4%	12 days	38.50	2.71	0.00
BDU+BDO IV	FM 21-40	600 Watts	4%	8 days	38.57	3.70	0.00
BDU+BDO IV	FM 21-40	600 Watts	4%	4 days	38.66	5.36	0.00
BDU+BDO IV	FM 21-40	600 Watts	4%	0 days	38.78	8.27	0.00
BDU+BDO IV	FM 21-40	600 Watts	6%	12 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	600 Watts	6%	8 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	600 Watts	6%	4 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40	600 Watts	6%	0 days	39.13	23.60	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	0%	12 days	37.55	.01	99.99
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	0%	8 days	37.59	.01	99.99
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	0%	4 days	37.70	.03	99.97
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	0%	0 days	38.09	.32	99.68
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	2%	12 days	37.95	.14	99.86
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	2%	8 days	38.02	.22	99.78
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	2%	4 days	38.15	.48	99.52
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	2%	0 days	38.43	2.00	98.00
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	4%	12 days	38.50	2.71	97.29
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	4%	8 days	38.57	3.70	96.30
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	4%	4 days	38.66	5.36	94.64
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	4%	0 days	38.78	8.27	91.73
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	6%	12 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	6%	8 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	6%	4 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-10 VARIANT	105 Watts	6%	0 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	0%	12 days	37.69	.02	46.99
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	0%	8 days	37.72	.03	46.99
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	0%	4 days	37.84	.07	46.97
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	0%	0 days	38.25	.79	46.63
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	2%	12 days	38.08	.31	46.85
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	2%	8 days	38.15	.46	46.78
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	2%	4 days	38.29	1.02	46.52
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	2%	0 days	38.59	4.05	45.10
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	4%	12 days	38.64	4.94	44.68
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	4%	8 days	38.72	6.64	43.88
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	4%	4 days	38.82	9.41	42.58
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	4%	0 days	38.94	14.06	40.39
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	6%	12 days	39.29	34.08	30.98
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	6%	8 days	39.29	34.08	30.98
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	6%	4 days	39.29	34.08	30.98
BDU+BDO IV	FM 21-10 VARIANT	150 Watts	6%	0 days	39.29	34.08	30.98
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	0%	12 days	38.76	7.81	43.33
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	0%	8 days	38.81	9.18	42.69
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	0%	4 days	38.96	15.01	39.95
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	0%	0 days	39.46	47.14	24.84
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	2%	12 days	39.17	26.50	34.55
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	2%	8 days	39.26	32.33	31.80
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	2%	4 days	39.44	45.68	25.53
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	2%	0 days	39.81	72.44	12.95
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	4%	12 days	39.79	71.19	13.54
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	4%	8 days	39.89	77.17	10.73
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	4%	4 days	40.01	83.64	7.69
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	4%	0 days	40.16	89.68	4.85
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	6%	12 days	40.50	97.33	1.25
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	6%	8 days	40.50	97.33	1.25
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	6%	4 days	40.50	97.33	1.25
BDU+BDO IV	FM 21-10 VARIANT	300 Watts	6%	0 days	40.50	97.33	1.25
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	0%	12 days	39.73	67.01	15.51
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	0%	8 days	39.78	70.73	13.76
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	0%	4 days	39.97	81.52	8.69
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	0%	0 days	40.58	98.11	.89
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	2%	12 days	40.15	89.51	4.93
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	2%	8 days	40.26	92.75	3.41
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	2%	4 days	40.48	96.97	1.42
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	2%	0 days	40.93	99.70	.14
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	4%	12 days	40.82	99.45	.26
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	4%	8 days	40.94	99.72	.13
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	4%	4 days	41.09	99.89	.05
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	4%	0 days	41.27	99.97	.01
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	6%	12 days	41.62	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	6%	8 days	41.62	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	6%	4 days	41.62	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	400 Watts	6%	0 days	41.62	100.00	0.00

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	0%	12 days	40.99	99.80	.09
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	0%	8 days	41.06	99.86	.07
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	0%	4 days	41.27	99.97	.01
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	0%	0 days	41.97	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	2%	12 days	41.43	99.99	.00
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	2%	8 days	41.55	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	2%	4 days	41.80	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	2%	0 days	42.32	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	4%	12 days	42.15	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	4%	8 days	42.28	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	4%	4 days	42.45	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	4%	0 days	42.67	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	6%	12 days	43.01	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	6%	8 days	43.01	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	6%	4 days	43.01	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	500 Watts	6%	0 days	43.01	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	0%	12 days	42.69	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	0%	8 days	42.76	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	0%	4 days	43.00	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	0%	0 days	43.80	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	2%	12 days	43.13	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	2%	8 days	43.27	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	2%	4 days	43.55	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	2%	0 days	44.14	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	4%	12 days	43.90	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	4%	8 days	44.05	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	4%	4 days	44.24	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	4%	0 days	44.49	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	6%	12 days	44.84	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	6%	8 days	44.84	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	6%	4 days	44.84	100.00	0.00
BDU+BDO IV	FM 21-10 VARIANT	600 Watts	6%	0 days	44.84	100.00	0.00
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	0%	12 days	37.55	.01	99.99
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	0%	8 days	37.59	.01	99.99
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	0%	4 days	37.70	.03	99.97
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	0%	0 days	38.09	.32	99.68
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	2%	12 days	37.95	.14	99.86
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	2%	8 days	38.02	.22	99.78
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	2%	4 days	38.15	.48	99.52
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	2%	0 days	38.43	2.00	98.00
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	4%	12 days	38.50	2.71	97.29
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	4%	8 days	38.57	3.70	96.30
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	4%	4 days	38.66	5.36	94.64
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	4%	0 days	38.78	8.27	91.73
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	6%	12 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	6%	8 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	6%	4 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-40 VARIANT	105 Watts	6%	0 days	39.13	23.60	76.40
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	0%	12 days	37.67	.02	37.99
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	0%	8 days	37.71	.03	37.99
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	0%	4 days	37.83	.07	37.97
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	0%	0 days	38.24	.76	37.71
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	2%	12 days	38.07	.30	37.89
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	2%	8 days	38.14	.45	37.83
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	2%	4 days	38.29	.98	37.63
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	2%	0 days	38.58	3.91	36.51
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	4%	12 days	38.63	4.79	36.18
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	4%	8 days	38.71	6.45	35.55
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	4%	4 days	38.81	9.16	34.52
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	4%	0 days	38.93	13.97	32.69
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	6%	12 days	39.28	33.49	25.27
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	6%	8 days	39.28	33.49	25.27
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	6%	4 days	39.28	33.49	25.27
BDU+BDO IV	FM 21-40 VARIANT	150 Watts	6%	0 days	39.28	33.49	25.27

Clothing	Thermal Discipline	Metabolic Rate	Dehydration Levels	Acclimation Levels	Highest Core Temperature (oC)	Casualty (%)	Productivity (%)
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	0%	12 days	38.16	.48	16.92
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	0%	8 days	38.19	.60	16.90
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	0%	4 days	38.33	1.19	16.80
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	0%	0 days	38.77	7.95	15.65
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	2%	12 days	38.56	3.48	16.41
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	2%	8 days	38.63	4.75	16.19
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	2%	4 days	38.79	8.55	15.55
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	2%	0 days	39.11	22.93	13.10
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	4%	12 days	39.14	24.14	12.90
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	4%	8 days	39.22	29.41	12.00
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	4%	4 days	39.33	36.82	10.74
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	4%	0 days	39.46	47.06	9.00
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	6%	12 days	39.81	72.36	4.70
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	6%	8 days	39.81	72.36	4.70
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	6%	4 days	39.81	72.36	4.70
BDU+BDO IV	FM 21-40 VARIANT	300 Watts	6%	0 days	39.81	72.36	4.70
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	0%	12 days	38.61	4.38	16.26
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	0%	8 days	38.66	5.22	16.11
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	0%	4 days	38.80	9.02	15.47
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	0%	0 days	39.31	35.57	10.95
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	2%	12 days	39.02	17.79	13.98
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	2%	8 days	39.11	22.38	13.20
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	2%	4 days	39.28	33.77	11.26
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	2%	0 days	39.65	61.67	6.52
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	4%	12 days	39.63	59.80	6.83
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	4%	8 days	39.72	66.65	5.67
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	4%	4 days	39.85	74.66	4.31
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	4%	0 days	40.00	83.25	2.85
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	6%	12 days	40.35	94.86	.87
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	6%	8 days	40.35	94.86	.87
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	6%	4 days	40.35	94.86	.87
BDU+BDO IV	FM 21-40 VARIANT	400 Watts	6%	0 days	40.35	94.86	.87
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	0%	12 days	37.55	.01	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	0%	8 days	37.59	.01	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	0%	4 days	37.70	.03	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	0%	0 days	38.09	.32	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	2%	12 days	37.95	.14	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	2%	8 days	38.02	.22	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	2%	4 days	38.15	.48	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	2%	0 days	38.43	2.00	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	4%	12 days	38.50	2.71	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	4%	8 days	38.57	3.70	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	4%	4 days	38.66	5.36	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	4%	0 days	38.78	8.27	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	6%	12 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	6%	8 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	6%	4 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40 VARIANT	500 Watts	6%	0 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	0%	12 days	37.55	.01	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	0%	8 days	37.59	.01	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	0%	4 days	37.70	.03	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	0%	0 days	38.09	.32	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	2%	12 days	37.95	.14	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	2%	8 days	38.02	.22	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	2%	4 days	38.15	.48	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	2%	0 days	38.43	2.00	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	4%	12 days	38.50	2.71	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	4%	8 days	38.57	3.70	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	4%	4 days	38.66	5.36	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	4%	0 days	38.78	8.27	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	6%	12 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	6%	8 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	6%	4 days	39.13	23.60	0.00
BDU+BDO IV	FM 21-40 VARIANT	600 Watts	6%	0 days	39.13	23.60	0.00

APPENDIX E:
Statistical Analysis of Study Results

```
set more=off.
include final.cmd.
get file='c:\workrest\aresults.sys'.
The SPSS/PC+ system file is read from
    file c:\workrest\aresults.sys
The file was created on 10/12/90 at 15:30:53
and is titled                    SPSS/PC+
The SPSS/PC+ system file contains
    288 cases, each consisting of
     39 variables (including system variables).
     39 variables will be used in this session.
```



```
This procedure was completed at 17:37:33
t-test pairs=a1 a2 a3 a4 a5 a6 a7 a8.
```


Paired samples t-test: A1 Productivity-NONE
A2 Productivity-FM 21-10

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A1	288	44.3511	43.524	2.565
A2	288	37.1165	33.772	1.990

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
7.2346	23.463	1.383	.845	.000	5.23	287	.000

Paired samples t-test: A1 Productivity-NONE
A3 Productivity-Tre39oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A1	288	44.3511	43.524	2.565
A3	288	55.1327	35.711	2.104

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-10.7816	15.462	.911	.943	.000	-11.83	287	.000

Paired samples t-test: A1 Productivity-NONE
A4 Productivity-Tre38.5oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error

A1	288	44.3511	43.524	2.565
A4	288	43.8926	40.141	2.365

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.4585	22.038	1.299	.864	.000	.35	287	.724

Paired samples t-test: A1 Productivity-NONE
A5 Productivity-Tre38oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A1	288	44.3511	43.524	2.565
A5	288	30.3193	39.779	2.344

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
14.0318	28.807	1.697	.764	.000	8.27	287	.000

Paired samples t-test: A1 Productivity-NONE
A6 Productivity-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A1	288	44.3511	43.524	2.565
A6	288	29.8828	37.856	2.231

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
14.4683	26.869	1.583	.791	.000	9.14	287	.000

Paired samples t-test: A1 Productivity-NONE
A7 Productivity-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A1	288	44.3511	43.524	2.565
A7	288	42.4142	40.525	2.388

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
1.9369	11.899	.701	.962	.000	2.76	287	.006

Paired samples t-test: A1 Productivity-NONE
A8 Productivity-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A1	288	44.3511	43.524	2.565
A8	288	33.5120	36.547	2.154

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
10.8390	22.704	1.338	.853	.000	8.10	287	.000

Paired samples t-test: A2 Productivity-FM 21-10
A3 Productivity-Tre39oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A2	288	37.1165	33.772	1.990
A3	288	55.1327	35.711	2.104

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-18.0162	18.764	1.106	.856	.000	-16.29	287	.000

Paired samples t-test: A2 Productivity-FM 21-10
A4 Productivity-Tre38.5oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A2	288	37.1165	33.772	1.990
A4	288	43.8926	40.141	2.365

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-6.7761	22.053	1.299	.836	.000	-5.21	287	.000

Paired samples t-test: A2 Productivity-FM 21-10
A5 Productivity-Tre38oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A2	288	37.1165	33.772	1.990
A5	288	30.3193	39.779	2.344

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
6.7972	21.845	1.287	.836	.000	5.28	287	.000

Paired samples t-test: A2 Productivity-FM 21-10
A6 Productivity-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A2	288	37.1165	33.772	1.990
A6	288	29.8828	37.856	2.231

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
7.2337	14.430	.850	.925	.000	8.51	287	.000

Paired samples t-test: A2 Productivity-FM 21-10
A7 Productivity-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A2	288	37.1165	33.772	1.990
A7	288	42.4142	40.525	2.388

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-5.2977	18.750	1.105	.888	.000	-4.79	287	.000

Paired samples t-test: A2 Productivity-FM 21-10
A8 Productivity-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A2	288	37.1165	33.772	1.990
A8	288	33.5120	36.547	2.154

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
3.6045	11.022	.649	.954	.000	5.55	287	.000

Paired samples t-test: A3 Productivity-Tre39oC
A4 Productivity-Tre38.5oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A3	288	55.1327	35.711	2.104
A4	288	43.8926	40.141	2.365

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
11.2401	15.452	.911	.924	.000	12.34	287	.000

Paired samples t-test: A3 Productivity-Tre39oC
A5 Productivity-Tre38oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A3	288	55.1327	35.711	2.104
A5	288	30.3193	39.779	2.344

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
24.8134	25.185	1.484	.783	.000	16.72	287	.000

Paired samples t-test: A3 Productivity-Tre39oC
A6 Productivity-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A3	288	55.1327	35.711	2.104
A6	288	29.8828	37.856	2.231

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
25.2499	25.389	1.496	.763	.000	16.88	287	.000

Paired samples t-test: A3 Productivity-Tre39oC
A7 Productivity-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A3	288	55.1327	35.711	2.104
A7	288	42.4142	40.525	2.388

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.

Mean	Deviation	Error	Corr.	Prob.	Value	Freedom	Prob.
12.7185	15.363	.905	.926	.000	14.05	287	.000

Paired samples t-test: A3 Productivity-Tre39oC
A8 Productivity-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A3	288	55.1327	35.711	2.104
A8	288	33.5120	36.547	2.154

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
21.6207	21.499	1.267	.823	.000	17.07	287	.000

Paired samples t-test: A4 Productivity-Tre38.5oC
A5 Productivity-Tre38oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A4	288	43.8926	40.141	2.365
A5	288	30.3193	39.779	2.344

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
13.5733	19.901	1.173	.876	.000	11.57	287	.000

Paired samples t-test: A4 Productivity-Tre38.5oC
A6 Productivity-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A4	288	43.8926	40.141	2.365
A6	288	29.8828	37.856	2.231

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
14.0098	27.873	1.642	.746	.000	8.53	287	.000

Paired samples t-test: A4 Productivity-Tre38.5oC
A7 Productivity-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A4	288	43.8926	40.141	2.365
A7	288	42.4142	40.525	2.388

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
1.4784	21.283	1.254	.861	.000	1.18	287	.239

Paired samples t-test: A4 Productivity-Tre38.5oC
A8 Productivity-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A4	288	43.8926	40.141	2.365
A8	288	33.5120	36.547	2.154

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
10.3805	25.068	1.477	.790	.000	7.03	287	.000

Paired samples t-test: A5 Productivity-Tre38oC
A6 Productivity-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A5	288	30.3193	39.779	2.344
A6	288	29.8828	37.856	2.231

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.4365	25.415	1.498	.787	.000	.29	287	.771

Paired samples t-test: A5 Productivity-Tre38oC
A7 Productivity-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A5	288	30.3193	39.779	2.344
A7	288	42.4142	40.525	2.388

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.

-12.0949	26.092	1.537	.789	.000	-7.87	287	.000

Paired samples t-test: A5 Productivity-Tre38oC
A8 Productivity-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A5	288	30.3193	39.779	2.344
A8	288	33.5120	36.547	2.154

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-3.1927	24.025	1.416	.805	.000	-2.26	287	.025

Paired samples t-test: A6 Productivity-FM 21-40
A7 Productivity-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A6	288	29.8828	37.856	2.231
A7	288	42.4142	40.525	2.388

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-12.5314	24.454	1.441	.807	.000	-8.70	287	.000

Paired samples t-test: A6 Productivity-FM 21-40
A8 Productivity-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A6	288	29.8828	37.856	2.231
A8	288	33.5120	36.547	2.154

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-3.6292	6.263	.369	.986	.000	-9.83	287	.000

Paired samples t-test: A7 Productivity-FM 21-10 Variant
A8 Productivity-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
A7	288	42.4142	40.525	2.388
A8	288	33.5120	36.547	2.154

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
8.9021	19.986	1.178	.870	.000	7.56	287	.000

This procedure was completed at 17:37:39
t-test pairs=c1 c2 c3 c4 c5 c6 c7 c8.

Paired samples t-test: C1 Casualty-NONE
C2 Casualty-FM 21-10

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C1	288	55.6489	43.524	2.565
C2	288	39.0886	39.273	2.314

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
16.5603	24.002	1.414	.837	.000	11.71	287	.000

Paired samples t-test: C1 Casualty-NONE
C3 Casualty-Tre39oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C1	288	55.6489	43.524	2.565
C3	288	13.7300	8.039	.474

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
41.9189	37.071	2.184	.836	.000	19.19	287	.000

Paired samples t-test: C1 Casualty-NONE
C4 Casualty-Tre38.5oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error

C1	288	55.6489	43.524	2.565
C4	288	5.4576	7.367	.434

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
50.1913	42.376	2.497	.238	.000	20.10	287	.000

Paired samples t-test: C1 Casualty-NONE
C5 Casualty-Tre38oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C1	288	55.6489	43.524	2.565
C5	288	4.0370	6.669	.393

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
51.6119	42.356	2.496	.249	.000	20.68	287	.000

Paired samples t-test: C1 Casualty-NONE
C6 Casualty-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C1	288	55.6489	43.524	2.565
C6	288	12.7119	22.889	1.349

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
42.9370	41.358	2.437	.355	.000	17.62	287	.000

Paired samples t-test: C1 Casualty-NONE
C7 Casualty-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C1	288	55.6489	43.524	2.565
C7	288	51.8884	43.276	2.550

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
3.7605	7.749	.457	.984	.000	8.24	287	.000

Paired samples t-test: C1 Casualty-NONE
C8 Casualty-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C1	288	55.6489	43.524	2.565
C8	288	20.6233	29.853	1.759

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
35.0257	38.236	2.253	.509	.000	15.55	287	.000

Paired samples t-test: C2 Casualty-FM 21-10
C3 Casualty-Tre39oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C2	288	39.0886	39.273	2.314
C3	288	13.7300	8.039	.474

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
25.3586	34.436	2.029	.667	.000	12.50	287	.000

Paired samples t-test: C2 Casualty-FM 21-10
C4 Casualty-Tre38.5oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C2	288	39.0886	39.273	2.314
C4	288	5.4576	7.367	.434

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
33.6310	37.604	2.216	.316	.000	15.18	287	.000

Paired samples t-test: C2 Casualty-FM 21-10
C5 Casualty-Tre38oC

Variable	Number		Standard	Standard

	of Cases	Mean	Deviation	Error
C2	288	39.0886	39.273	2.314
C5	288	4.0370	6.669	.393

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
35.0516	37.072	2.185	.406	.000	16.05	287	.000

Paired samples t-test: C2 Casualty-FM 21-10
C6 Casualty-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C2	288	39.0886	39.273	2.314
C6	288	12.7119	22.889	1.349

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
26.3768	32.837	1.935	.550	.000	13.63	287	.000

Paired samples t-test: C2 Casualty-FM 21-10
C7 Casualty-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C2	288	39.0886	39.273	2.314
C7	288	51.8884	43.276	2.550

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-12.7998	19.747	1.164	.890	.000	-11.00	287	.000

Paired samples t-test: C2 Casualty-FM 21-10
C8 Casualty-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C2	288	39.0886	39.273	2.314
C8	288	20.6233	29.853	1.759

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.

18.4654	30.208	1.780	.649	.000	10.37	287	.000

Paired samples t-test: C3 Casualty-Tre39oC
C4 Casualty-Tre38.5oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C3	288	13.7300	8.039	.474
C4	288	5.4576	7.367	.434

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
8.2724	8.175	.482	.440	.000	17.17	287	.000

Paired samples t-test: C3 Casualty-Tre39oC
C5 Casualty-Tre38oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C3	288	13.7300	8.039	.474
C5	288	4.0370	6.669	.393

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
9.6930	8.185	.482	.393	.000	20.10	287	.000

Paired samples t-test: C3 Casualty-Tre39oC
C6 Casualty-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C3	288	13.7300	8.039	.474
C6	288	12.7119	22.889	1.349

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
1.0181	21.354	1.258	.360	.000	.81	287	.419

Paired samples t-test: C3 Casualty-Tre39oC
C7 Casualty-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C3	288	13.7300	8.039	.474
C7	288	51.8884	43.276	2.550

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-38.1584	37.255	2.195	.790	.000	-17.38	287	.000

Paired samples t-test: C3 Casualty-Tre39oC
C8 Casualty-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C3	288	13.7300	8.039	.474
C8	288	20.6233	29.853	1.759

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-6.8933	27.101	1.597	.461	.000	-4.32	287	.000

Paired samples t-test: C4 Casualty-Tre38.5oC
C5 Casualty-Tre38oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C4	288	5.4576	7.367	.434
C5	288	4.0370	6.669	.393

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
1.4206	3.213	.189	.900	.000	7.50	287	.000

Paired samples t-test: C4 Casualty-Tre38.5oC
C6 Casualty-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C4	288	5.4576	7.367	.434
C6	288	12.7119	22.889	1.349

(Difference)	Standard	Standard	2-Tail	t	Degrees of	2-Tail

Mean	Deviation	Error	Corr.	Prob.	Value	Freedom	Prob.
-7.2542	22.094	1.302	.267	.000	-5.57	287	.000

Paired samples t-test: C4 Casualty-Tre38.5oC
C7 Casualty-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C4	288	5.4576	7.367	.434
C7	288	51.8884	43.276	2.550

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-46.4308	42.251	2.490	.223	.000	-18.65	287	.000

Paired samples t-test: C4 Casualty-Tre38.5oC
C8 Casualty-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C4	288	5.4576	7.367	.434
C8	288	20.6233	29.853	1.759

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-15.1656	28.433	1.675	.312	.000	-9.05	287	.000

Paired samples t-test: C5 Casualty-Tre38oC
C6 Casualty-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C5	288	4.0370	6.669	.393
C6	288	12.7119	22.889	1.349

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-8.6748	21.917	1.291	.288	.000	-6.72	287	.000

Paired samples t-test: C5 Casualty-Tre38oC

C7 Casualty-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C5	288	4.0370	6.669	.393
C7	288	51.8884	43.276	2.550

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-47.8514	42.034	2.477	.261	.000	-19.32	287	.000

Paired samples t-test: C5 Casualty-Tre38oC
C8 Casualty-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C5	288	4.0370	6.669	.393
C8	288	20.6233	29.853	1.759

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-16.5862	28.021	1.651	.378	.000	-10.05	287	.000

Paired samples t-test: C6 Casualty-FM 21-40
C7 Casualty-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C6	288	12.7119	22.889	1.349
C7	288	51.8884	43.276	2.550

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-39.1766	40.337	2.377	.388	.000	-16.48	287	.000

Paired samples t-test: C6 Casualty-FM 21-40
C8 Casualty-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C6	288	12.7119	22.889	1.349
C8	288	20.6233	29.853	1.759

(Difference) Standard	Standard	2-Tail	t	Degrees of	2-Tail

Mean	Deviation	Error	Corr.	Prob.	Value	Freedom	Prob.
-7.9114	16.432	.968	.838	.000	-8.17	287	.000

Paired samples t-test: C7 Casualty-FM 21-10 Variant
C8 Casualty-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
C7	288	51.8884	43.276	2.550
C8	288	20.6233	29.853	1.759

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
31.2652	37.103	2.186	.537	.000	14.30	287	.000

This procedure was completed at 17:37:44
t-test pairs=t1 t2 t3 t4 t5 t6 t7 t8.

Paired samples t-test: T1 Core Temp-NONE
T2 Core Temp-FM 21-10

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T1	288	40.1863	2.068	.122
T2	288	39.2049	1.079	.064

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.9813	1.241	.073	.874	.000	13.42	287	.000

Paired samples t-test: T1 Core Temp-NONE
T3 Core Temp-Tre39oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T1	288	40.1863	2.068	.122
T3	288	38.7635	.493	.029

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
1.4227	1.794	.106	.638	.000	13.46	287	.000

Paired samples t-test: T1 Core Temp-NONE
T4 Core Temp-Tre38.5oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T1	288	40.1863	2.068	.122
T4	288	38.4967	.398	.023

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
1.6895	1.884	.111	.539	.000	15.22	287	.000

Paired samples t-test: T1 Core Temp-NONE
T5 Core Temp-Tre38oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T1	288	40.1863	2.068	.122
T5	288	38.2955	.441	.026

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
1.8908	1.905	.112	.463	.000	16.84	287	.000

Paired samples t-test: T1 Core Temp-NONE
T6 Core Temp-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T1	288	40.1863	2.068	.122
T6	288	38.4631	.740	.044

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
1.7232	1.974	.116	.303	.000	14.81	287	.000

Paired samples t-test: T1 Core Temp-NONE
T7 Core Temp-FM 21-10 Variant

Variable	Number	Standard	Standard

	of Cases	Mean	Deviation	Error
T1	288	40.1863	2.068	.122
T7	288	39.8494	1.711	.101

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.3369	.429	.025	.992	.000	13.34	287	.000

Paired samples t-test: T1 Core Temp-NONE
T8 Core Temp-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T1	288	40.1863	2.068	.122
T8	288	38.6944	.843	.050

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
1.4918	1.973	.116	.314	.000	12.83	287	.000

Paired samples t-test: T2 Core Temp-FM 21-10
T3 Core Temp-Tre39oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T2	288	39.2049	1.079	.064
T3	288	38.7635	.493	.029

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.4414	.789	.046	.738	.000	9.50	287	.000

Paired samples t-test: T2 Core Temp-FM 21-10
T4 Core Temp-Tre38.5oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T2	288	39.2049	1.079	.064
T4	288	38.4967	.398	.023

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.

.7082	.859	.051	.680	.000	13.99	287	.000

Paired samples t-test: T2 Core Temp-FM 21-10
T5 Core Temp-Tre38oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T2	288	39.2049	1.079	.064
T5	288	38.2955	.441	.026

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.9094	.863	.051	.645	.000	17.89	287	.000

Paired samples t-test: T2 Core Temp-FM 21-10
T6 Core Temp-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T2	288	39.2049	1.079	.064
T6	288	38.4631	.740	.044

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.7418	.762	.045	.709	.000	16.53	287	.000

Paired samples t-test: T2 Core Temp-FM 21-10
T7 Core Temp-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T2	288	39.2049	1.079	.064
T7	288	39.8494	1.711	.101

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-.6444	.825	.049	.924	.000	-13.25	287	.000

Paired samples t-test: T2 Core Temp-FM 21-10
T8 Core Temp-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T2	288	39.2049	1.079	.064
T8	288	38.6944	.843	.050

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.5105	.764	.045	.710	.000	11.34	287	.000

Paired samples t-test: T3 Core Temp-Tre39oC
T4 Core Temp-Tre38.5oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T3	288	38.7635	.493	.029
T4	288	38.4967	.398	.023

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.2668	.238	.014	.878	.000	19.00	287	.000

Paired samples t-test: T3 Core Temp-Tre39oC
T5 Core Temp-Tre38oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T3	288	38.7635	.493	.029
T5	288	38.2955	.441	.026

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.4681	.411	.024	.618	.000	19.32	287	.000

Paired samples t-test: T3 Core Temp-Tre39oC
T6 Core Temp-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T3	288	38.7635	.493	.029
T6	288	38.4631	.740	.044

(Difference) Standard Standard | 2-Tail | t Degrees of 2-Tail

Mean	Deviation	Error	Corr.	Prob.	Value	Freedom	Prob.
.3005	.644	.038	.516	.000	7.92	287	.000

Paired samples t-test: T3 Core Temp-Tre39oC
T7 Core Temp-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T3	288	38.7635	.493	.029
T7	288	39.8494	1.711	.101

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-1.0858	1.427	.084	.672	.000	-12.91	287	.000

Paired samples t-test: T3 Core Temp-Tre39oC
T8 Core Temp-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T3	288	38.7635	.493	.029
T8	288	38.6944	.843	.050

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.0691	.678	.040	.594	.000	1.73	287	.085

Paired samples t-test: T4 Core Temp-Tre38.5oC
T5 Core Temp-Tre38oC

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T4	288	38.4967	.398	.023
T5	288	38.2955	.441	.026

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.2012	.228	.013	.856	.000	14.94	287	.000

Paired samples t-test: T4 Core Temp-Tre38.5oC

T6 Core Temp-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T4	288	38.4967	.398	.023
T6	288	38.4631	.740	.044

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.0336	.592	.035	.603	.000	.96	287	.336

Paired samples t-test: T4 Core Temp-Tre38.5oC
T7 Core Temp-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T4	288	38.4967	.398	.023
T7	288	39.8494	1.711	.101

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-1.3527	1.518	.089	.573	.000	-15.12	287	.000

Paired samples t-test: T4 Core Temp-Tre38.5oC
T8 Core Temp-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T4	288	38.4967	.398	.023
T8	288	38.6944	.843	.050

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-.1977	.671	.040	.624	.000	-5.00	287	.000

Paired samples t-test: T5 Core Temp-Tre38oC
T6 Core Temp-FM 21-40

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T5	288	38.2955	.441	.026
T6	288	38.4631	.740	.044

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-.1676	.540	.032	.689	.000	-5.26	287	.000

Paired samples t-test: T5 Core Temp-Tre38oC
T7 Core Temp-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T5	288	38.2955	.441	.026
T7	288	39.8494	1.711	.101

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-1.5539	1.539	.091	.500	.000	-17.14	287	.000

Paired samples t-test: T5 Core Temp-Tre38oC
T8 Core Temp-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T5	288	38.2955	.441	.026
T8	288	38.6944	.843	.050

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-.3990	.645	.038	.658	.000	-10.50	287	.000

Paired samples t-test: T6 Core Temp-FM 21-40
T7 Core Temp-FM 21-10 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T6	288	38.4631	.740	.044
T7	288	39.8494	1.711	.101

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-1.3863	1.564	.092	.406	.000	-15.04	287	.000

Paired samples t-test: T6 Core Temp-FM 21-40
T8 Core Temp-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T6	288	38.4631	.740	.044
T8	288	38.6944	.843	.050

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-.2314	.352	.021	.909	.000	-11.15	287	.000

Paired samples t-test: T7 Core Temp-FM 21-10 Variant
T8 Core Temp-FM 21-40 Variant

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
T7	288	39.8494	1.711	.101
T8	288	38.6944	.843	.050

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
1.1549	1.568	.092	.408	.000	12.50	287	.000

This procedure was completed at 17:37:50
get file='c:\workrest\results.sys'.
The SPSS/PC+ system file is read from
file c:\workrest\results.sys
The file was created on 10/12/90 at 15:33:30
and is titled SPSS/PC+
The SPSS/PC+ system file contains
2304 cases, each consisting of
34 variables (including system variables).
34 variables will be used in this session.

This procedure was completed at 17:37:50
anova product by discip(1,8) with met dehyd acclim.

'ANOVA' PROBLEM REQUIRES 1632 BYTES OF MEMORY.

* * * A N A L Y S I S O F V A R I A N C E * * *

PRODUCT PERCENT PRODUCTIVITY
BY DISCIP THERMAL DISCIPLINE
WITH MET DEMANDED METABOLIC RATE (Watts)
DEHYD DEHYDRATION (%)
ACCLIM ACCLIMATIZATION (days)

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F

Covariates	2233014.592	3	744338.197	1438.425	.000
MET	1874497.761	1	1874497.761	3622.446	.000
DEHYD	330901.494	1	330901.494	639.464	.000
ACCLIM	27615.337	1	27615.337	53.366	.000
Main Effects	148021.919	7	21145.988	40.864	.000
DISCIP	148021.919	7	21145.988	40.864	.000

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Explained	2381036.511	10	238103.651	460.133	.000
Residual	1186552.632	2293	517.467		
Total	3567589.143	2303	1549.105		

2304 Cases were processed.
0 Cases (.0 PCT) were missing.

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This procedure was completed at 17:37:56
get file='c:\workrest\results.sys'.
The SPSS/PC+ system file is read from
file c:\workrest\results.sys

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This procedure was completed at 17:37:57
select if (dehyd eq 0 or dehyd eq 1).
select if (cloth eq 1).
oneway product by discip(1,8)/ranges=lsd(.5)/statistics=1.
The raw data or transformation pass is proceeding
192 cases are written to the uncompressed active file.

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Variable PRODUCT PERCENT PRODUCTIVITY

By Variable DISCIP THERMAL DISCIPLINE

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	15582.8027	2226.1147	2.8376	.0078
Within Groups	184	144350.7989	784.5152		
Total	191	159933.6015			

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Standard Standard

Group	Count	Mean	Deviation	Error	95 Pct Conf Int for Mean
Grp 1	24	77.9567	32.2427	6.5815	64.3417 To 91.5716
Grp 2	24	67.4171	24.4058	4.9818	57.1114 To 77.7228
Grp 3	24	85.9570	18.9688	3.8720	77.9472 To 93.9668
Grp 4	24	81.8043	22.9626	4.6872	72.1081 To 91.5006
Grp 5	24	68.4578	31.3366	6.3966	55.2255 To 81.6900
Grp 6	24	58.8353	30.2049	6.1656	46.0808 To 71.5897
Grp 7	24	73.4850	31.1350	6.3554	60.3378 To 86.6321
Grp 8	24	61.3284	29.8342	6.0899	48.7305 To 73.9263
Total	192	71.9052	28.9370	2.0883	67.7860 To 76.0244

Group	Minimum	Maximum
Grp 1	.4700	100.0000
Grp 2	1.7550	100.0000
Grp 3	37.9525	100.0000

Group	Minimum	Maximum
Grp 4	29.0460	100.0000
Grp 5	13.9678	100.0000
Grp 6	19.3800	100.0000
Grp 7	.3813	100.0000
Grp 8	6.5428	100.0000
Total	.3813	100.0000

Variable PRODUCT PERCENT PRODUCTIVITY
By Variable DISCIP THERMAL DISCIPLINE

Multiple Range Test

LSD Procedure
Ranges for the .500 level -

.96 .96 .96 .96 .96 .96 .96

The ranges above are table ranges.
The value actually compared with Mean(J)-Mean(I) is..
19.8055 * Range * Sqrt(1/N(I) + 1/N(J))

(*) Denotes pairs of groups significantly different at the .500 level

Variable PRODUCT PERCENT PRODUCTIVITY
(Continued)

Mean	Group	Grp 6	Grp 8	Grp 2	Grp 5	Grp 7	Grp 1	Grp 4	Grp 3
58.8353	Grp 6								
61.3284	Grp 8								
67.4171	Grp 2	*	*						
68.4578	Grp 5	*	*						
73.4850	Grp 7	*	*	*					
77.9567	Grp 1	*	*	*	*				
81.8043	Grp 4	*	*	*	*	*			
85.9570	Grp 3	*	*	*	*	*	*		

Homogeneous Subsets (Subsets of groups, whose highest and lowest means do not differ by more than the shortest significant range for a subset of that size)

SUBSET 1

Group	Grp 6	Grp 8
Mean	58.8353	61.3284

SUBSET 2

Group	Grp 2	Grp 5
Mean	67.4171	68.4578

SUBSET 3

Group	Grp 5	Grp 7
Mean	68.4578	73.4850

SUBSET 4

Group	Grp 7	Grp 1
Mean	73.4850	77.9567

SUBSET 5

Group	Grp 1	Grp 4
Mean	77.9567	81.8043

SUBSET 6

Group	Grp 4	Grp 3
Mean	81.8043	85.9570


```
This procedure was completed at 17:38:07
get file='c:\workrest\results.sys'.
The SPSS/PC+ system file is read from
    file c:\workrest\results.sys
```



```
This procedure was completed at 17:38:08
select if (dehyd eq 0 or dehyd eq 1).
select if (cloth eq 2).
oneway product by discip(1,8)/ranges=lsd(.5)/statistics=1.
The raw data or transformation pass is proceeding
    192 cases are written to the uncompressed active file.
```


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Variable PRODUCT PERCENT PRODUCTIVITY

By Variable DISCIP THERMAL DISCIPLINE

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	65130.7411	9304.3916	7.8970	.0000
Within Groups	184	216790.9658	1178.2118		
Total	191	281921.7070			

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	24	58.4687	44.2431	9.0311	39.7865 To 77.1510
Grp 2	24	42.2786	26.6920	5.4485	31.0076 To 53.5497
Grp 3	24	75.8304	24.8879	5.0802	65.3212 To 86.3396
Grp 4	24	71.3781	28.5038	5.8183	59.3420 To 83.4142
Grp 5	24	56.3092	34.4075	7.0234	41.7802 To 70.8383
Grp 6	24	21.4965	37.4524	7.6449	5.6817 To 37.3112
Grp 7	24	63.7234	38.7627	7.9124	47.3553 To 80.0914
Grp 8	24	28.5885	35.1398	7.1729	13.7503 To 43.4268
Total	192	52.2592	38.4191	2.7727	46.7902 To 57.7282

Group	Minimum	Maximum
Grp 1	.0000	100.0000
Grp 2	14.1801	100.0000
Grp 3	28.3780	100.0000

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Minimum	Maximum
Grp 4	21.3004	100.0000
Grp 5	7.9824	100.0000
Grp 6	.0000	100.0000
Grp 7	.0000	100.0000
Grp 8	.0000	100.0000
Total	.0000	100.0000

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Variable PRODUCT PERCENT PRODUCTIVITY
By Variable DISCIP THERMAL DISCIPLINE

Multiple Range Test

LSD Procedure
Ranges for the .500 level -

.96 .96 .96 .96 .96 .96 .96

The ranges above are table ranges.
The value actually compared with Mean(J)-Mean(I) is..
24.2715 * Range * Sqrt(1/N(I) + 1/N(J))

(*) Denotes pairs of groups significantly different at the .500 level

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Variable PRODUCT PERCENT PRODUCTIVITY
(Continued)

Mean	Group	Grp 6	Grp 8	Grp 2	Grp 5	Grp 1	Grp 7	Grp 4
21.4965	Grp 6							
28.5885	Grp 8	*						
42.2786	Grp 2	*	*					
56.3092	Grp 5	*	*	*				
58.4687	Grp 1	*	*	*				
63.7234	Grp 7	*	*	*	*			
71.3781	Grp 4	*	*	*	*	*	*	

```
   75.8304    Grp 3      * * * * * *
-------------------------------------------------------------------------------
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  Homogeneous Subsets   (Subsets of groups, whose highest and lowest means
                         do not differ by more than the shortest
                         significant range for a subset of that size)


SUBSET  1

Group        Grp 6
Mean       21.4965
- - - - - - - - - - -

SUBSET  2

Group        Grp 8
Mean       28.5885
- - - - - - - - - - -

SUBSET  3

Group        Grp 2
Mean       42.2786
- - - - - - - - - - -
-------------------------------------------------------------------------------
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SUBSET  4

Group        Grp 5         Grp 1
Mean       56.3092       58.4687
- - - - - - - - - - - - - - - - - -

SUBSET  5

Group        Grp 1         Grp 7
Mean       58.4687       63.7234
- - - - - - - - - - - - - - - - - -

SUBSET  6

Group        Grp 4         Grp 3
Mean       71.3781       75.8304
- - - - - - - - - - - - - - - - - -
-------------------------------------------------------------------------------
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This procedure was completed at 17:38:17
get file='c:\workrest\results.sys'.
The SPSS/PC+ system file is read from
    file c:\workrest\results.sys
-------------------------------------------------------------------------------
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This procedure was completed at 17:38:18
select if (dehyd eq 0 or dehyd eq 1).
select if (cloth eq 3).
oneway product by discip(1,8)/ranges=lsd(.5)/statistics=1.
The raw data or transformation pass is proceeding
```

192 cases are written to the uncompressed active file.

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable PRODUCT PERCENT PRODUCTIVITY

By Variable DISCIP THERMAL DISCIPLINE

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	33561.2966	4794.4709	3.5725	.0013
Within Groups	184	246938.7898	1342.0586		
Total	191	280500.0864			

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	24	43.2046	46.4911	9.4900	23.5731 To 62.8361
Grp 2	24	34.6356	31.7032	6.4714	21.2485 To 48.0226
Grp 3	24	62.9086	30.5360	6.2331	50.0143 To 75.8028
Grp 4	24	57.1023	33.5787	6.8542	42.9233 To 71.2813
Grp 5	24	41.0625	39.5293	8.0689	24.3708 To 57.7543
Grp 6	24	21.4740	37.4213	7.6386	5.6723 To 37.2756
Grp 7	24	32.3757	36.1060	7.3701	17.1294 To 47.6219
Grp 8	24	28.1811	35.2620	7.1978	13.2912 To 43.0709
Total	192	40.1180	38.3221	2.7657	34.6629 To 45.5732

Group	Minimum	Maximum
Grp 1	.0000	99.9900
Grp 2	.3993	99.9900
Grp 3	21.9402	99.9900

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Minimum	Maximum
Grp 4	12.5866	99.9900
Grp 5	1.6958	99.9900
Grp 6	.0000	99.9900
Grp 7	.0000	99.9900
Grp 8	.0000	99.9900
Total	.0000	99.9900

- - - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable PRODUCT PERCENT PRODUCTIVITY
By Variable DISCIP THERMAL DISCIPLINE

Multiple Range Test

LSD Procedure
Ranges for the .500 level -

.96 .96 .96 .96 .96 .96 .96

The ranges above are table ranges.
The value actually compared with Mean(J)-Mean(I) is..
25.9042 * Range * Sqrt(1/N(I) + 1/N(J))

(*) Denotes pairs of groups significantly different at the .500 level

- - - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable PRODUCT PERCENT PRODUCTIVITY
(Continued)

Mean	Group	Grp 6	Grp 8	Grp 7	Grp 2	Grp 5	Grp 1	Grp 4	Grp 3
21.4740	Grp 6								
28.1811	Grp 8								
32.3757	Grp 7	*							
34.6356	Grp 2	*							
41.0625	Grp 5	*	*	*					
43.2046	Grp 1	*	*	*	*				
57.1023	Grp 4	*	*	*	*	*	*		
62.9086	Grp 3	*	*	*	*	*	*		

Homogeneous Subsets (Subsets of groups, whose highest and lowest means do not differ by more than the shortest significant range for a subset of that size)

SUBSET 1

Group	Grp 6	Grp 8
Mean	21.4740	28.1811

- - - - - - - - - - - - - - - - - -

SUBSET 2

Group	Grp 8	Grp 7	Grp 2
Mean	28.1811	32.3757	34.6356

SUBSET 3

Group	Grp 2	Grp 5
Mean	34.6356	41.0625

SUBSET 4

Group	Grp 5	Grp 1
Mean	41.0625	43.2046

SUBSET 5

Group	Grp 4	Grp 3
Mean	57.1023	62.9086

This procedure was completed at 17:38:27
get file='c:\workrest\results.sys'.
The SPSS/PC+ system file is read from
file c:\workrest\results.sys

This procedure was completed at 17:38:28
select if (dehyd eq 3 or dehyd eq 4).
select if (cloth eq 1).
oneway product by discip(1,8)/ranges=lsd(.5)/statistics=1.
The raw data or transformation pass is proceeding
192 cases are written to the uncompressed active file.

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Variable PRODUCT PERCENT PRODUCTIVITY

By Variable DISCIP THERMAL DISCIPLINE

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	24001.8317	3428.8331	2.3620	.0247
Within Groups	184	267104.8119	1451.6566		
Total	191	291106.6437			

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	24	48.1958	42.4793	8.6711	30.2584 To 66.1333
Grp 2	24	43.7464	36.6481	7.4808	28.2712 To 59.2215
Grp 3	24	60.6127	30.7067	6.2680	47.6464 To 73.5790
Grp 4	24	46.7164	37.1739	7.5881	31.0192 To 62.4135
Grp 5	24	17.8780	37.4175	7.6378	2.0780 To 33.6781
Grp 6	24	47.2859	37.9423	7.7449	31.2642 To 63.3075
Grp 7	24	46.1932	41.1660	8.4030	28.8103 To 63.5761
Grp 8	24	45.9132	40.0818	8.1817	28.9881 To 62.8383
Total	192	44.5677	39.0400	2.8175	39.0103 To 50.1250

Group	Minimum	Maximum
Grp 1	.0000	99.7200
Grp 2	.0300	99.7200
Grp 3	19.3968	99.7200

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Minimum	Maximum
Grp 4	7.7480	99.7200
Grp 5	.0000	99.7200
Grp 6	3.6138	99.7200
Grp 7	.0000	99.7200
Grp 8	.3828	99.7200
Total	.0000	99.7200

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable PRODUCT PERCENT PRODUCTIVITY
By Variable DISCIP THERMAL DISCIPLINE

Multiple Range Test

LSD Procedure
Ranges for the .500 level -

.96 .96 .96 .96 .96 .96 .96

The ranges above are table ranges.
The value actually compared with Mean(J)-Mean(I) is..
26.9412 * Range * Sqrt(1/N(I) + 1/N(J))

(*) Denotes pairs of groups significantly different at the .500 level

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- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable PRODUCT PERCENT PRODUCTIVITY
(Continued)

Mean	Group	Grp 5	Grp 2	Grp 8	Grp 7	Grp 4	Grp 6	Grp 1	Grp 3
17.8780	Grp 5								
43.7464	Grp 2	*							
45.9132	Grp 8	*							
46.1932	Grp 7	*							
46.7164	Grp 4	*							
47.2859	Grp 6	*							
48.1958	Grp 1	*							
60.6127	Grp 3	*	*	*	*	*	*	*	

Homogeneous Subsets (Subsets of groups, whose highest and lowest means do not differ by more than the shortest significant range for a subset of that size)

SUBSET 1

Group	Grp 5
Mean	17.8780

- - - - - - - - - - -

SUBSET 2

Group	Grp 2	Grp 8	Grp 7	Grp 4	Grp 6
Mean	43.7464	45.9132	46.1932	46.7164	47.2859

Group	Grp 1
Mean	48.1958

- -

SUBSET 3

Group	Grp 3
Mean	60.6127

- - - - - - - - - - -

This procedure was completed at 17:38:38
get file='c:\workrest\results.sys'.

The SPSS/PC+ system file is read from
file c:\workrest\results.sys

This procedure was completed at 17:38:38
select if (dehyd eq 3 or dehyd eq 4).
select if (cloth eq 2).
oneway product by discip(1,8)/ranges=lsd(.5)/statistics=1.
The raw data or transformation pass is proceeding
192 cases are written to the uncompressed active file.

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable PRODUCT PERCENT PRODUCTIVITY

By Variable DISCIP THERMAL DISCIPLINE

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	21799.4597	3114.2085	2.1881	.0372
Within Groups	184	261874.1475	1423.2291		
Total	191	283673.6073			

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Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	24	38.4821	44.1486	9.0118	19.8398 To 57.1244
Grp 2	24	32.8798	31.5108	6.4321	19.5740 To 46.1856
Grp 3	24	51.5846	34.2302	6.9872	37.1304 To 66.0387
Grp 4	24	35.5060	38.4385	7.8462	19.2748 To 51.7371
Grp 5	24	16.4433	37.5605	7.6670	.5829 To 32.3037
Grp 6	24	21.1665	36.9475	7.5419	5.5649 To 36.7680
Grp 7	24	41.8025	42.2828	8.6309	23.9480 To 59.6570
Grp 8	24	27.0798	35.0832	7.1613	12.2655 To 41.8941
Total	192	33.1181	38.5383	2.7813	27.6321 To 38.6040

Group	Minimum	Maximum
Grp 1	.0000	99.4100
Grp 2	2.1516	99.4100
Grp 3	12.9648	99.4100

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Group	Minimum	Maximum
Grp 4	1.9378	99.4100
Grp 5	.0000	99.4100
Grp 6	.0000	99.4100
Grp 7	.0000	99.4100
Grp 8	.0000	99.4100
Total	.0000	99.4100

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Variable PRODUCT PERCENT PRODUCTIVITY
By Variable DISCIP THERMAL DISCIPLINE

Multiple Range Test

LSD Procedure
Ranges for the .500 level -

.96 .96 .96 .96 .96 .96 .96

The ranges above are table ranges.
The value actually compared with Mean(J)-Mean(I) is..
26.6761 * Range * Sqrt(1/N(I) + 1/N(J))

(*) Denotes pairs of groups significantly different at the .500 level

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Variable PRODUCT PERCENT PRODUCTIVITY
(Continued)

Mean	Group	Grp 5	Grp 6	Grp 8	Grp 2	Grp 4	Grp 1	Grp 7	Grp 3
16.4433	Grp 5								
21.1665	Grp 6								
27.0798	Grp 8	*							
32.8798	Grp 2	*	*						
35.5060	Grp 4	*	*	*					
38.4821	Grp 1	*	*	*					
41.8025	Grp 7	*	*	*	*				
51.5846	Grp 3	*	*	*	*	*	*	*	

Homogeneous Subsets (Subsets of groups, whose highest and lowest means

do not differ by more than the shortest
significant range for a subset of that size)

SUBSET 1

Group	Grp 5	Grp 6
Mean	16.4433	21.1665

SUBSET 2

Group	Grp 6	Grp 8
Mean	21.1665	27.0798

SUBSET 3

Group	Grp 8	Grp 2
Mean	27.0798	32.8798

SUBSET 4

Group	Grp 2	Grp 4	Grp 1
Mean	32.8798	35.5060	38.4821

SUBSET 5

Group	Grp 4	Grp 1	Grp 7
Mean	35.5060	38.4821	41.8025

SUBSET 6

Group	Grp 3
Mean	51.5846

This procedure was completed at 17:38:48
get file='c:\workrest\results.sys'.
The SPSS/PC+ system file is read from
file c:\workrest\results.sys

This procedure was completed at 17:38:49
select if (dehyd eq 3 or dehyd eq 4).
select if (cloth eq 3).
oneway product by discip(1,8)/ranges=lsd(.5)/statistics=1.
The raw data or transformation pass is proceeding
192 cases are written to the uncompressed active file.

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Variable PRODUCT PERCENT PRODUCTIVITY

By Variable DISCIP THERMAL DISCIPLINE

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	9882.6165	1411.8024	1.0715	.3835
Within Groups	184	242431.5456	1317.5627		
Total	191	252314.1622			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	24	30.3721	42.5716	8.6899	12.3957 To 48.3485
Grp 2	24	24.2996	34.0590	6.9523	9.9177 To 38.6815
Grp 3	24	40.4274	35.7378	7.2949	25.3367 To 55.5182
Grp 4	24	18.8954	35.3335	7.2124	3.9753 To 33.8154
Grp 5	24	15.8317	36.1727	7.3837	.5573 To 31.1061
Grp 6	24	20.2530	35.5604	7.2587	5.2371 To 35.2688
Grp 7	24	24.5314	35.7615	7.2998	9.4306 To 39.6321
Grp 8	24	24.2998	34.5051	7.0433	9.7296 To 38.8700
Total	192	24.8638	36.3458	2.6230	19.6900 To 30.0376

Group	Minimum	Maximum
Grp 1	.0000	97.2900
Grp 2	.0066	97.2900
Grp 3	7.3215	97.2900

Group	Minimum	Maximum
Grp 4	.0000	97.2900
Grp 5	.0000	97.2900
Grp 6	.0000	97.2900
Grp 7	.0000	97.2900
Grp 8	.0000	97.2900
Total	.0000	97.2900

Variable PRODUCT PERCENT PRODUCTIVITY

By Variable DISCIP THERMAL DISCIPLINE

Multiple Range Test

LSD Procedure
Ranges for the .500 level -

.96 .96 .96 .96 .96 .96 .96

The ranges above are table ranges.
The value actually compared with Mean(J)-Mean(I) is..
25.6667 * Range * Sqrt(1/N(I) + 1/N(J))

(*) Denotes pairs of groups significantly different at the .500 level

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Variable PRODUCT PERCENT PRODUCTIVITY
(Continued)

Mean	Group	Grp 5	Grp 4	Grp 6	Grp 2	Grp 8	Grp 7	Grp 1	Grp 3
15.8317	Grp 5								
18.8954	Grp 4								
20.2530	Grp 6								
24.2996	Grp 2	*							
24.2998	Grp 8	*							
24.5314	Grp 7	*							
30.3721	Grp 1	*	*	*					
40.4274	Grp 3	*	*	*	*	*	*	*	

Homogeneous Subsets (Subsets of groups, whose highest and lowest means do not differ by more than the shortest significant range for a subset of that size)

SUBSET 1

Group	Grp 5	Grp 4	Grp 6
Mean	15.8317	18.8954	20.2530

SUBSET 2

Group	Grp 4	Grp 6	Grp 2	Grp 8	Grp 7
Mean	18.8954	20.2530	24.2996	24.2998	24.5314

SUBSET 3

Group	Grp 2	Grp 8	Grp 7	Grp 1
Mean	24.2996	24.2998	24.5314	30.3721

SUBSET 4

Group	Grp 3
Mean	40.4274